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MILITARY HISTORY, STRATEGY & ANALYSIS

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Reflections

by Lee Teter

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MILITARY HISTORY, STRATEGY & ANALYSIS

NOV-DEC 1992 ISSUE 19

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I certify that the statements made by me above are correct and complete.

Christopher Perello
Business Manager

A Note From The Publisher

The feedback results from issue no. 17 came in this way:

Poland '39	7.26
Gettysburg	7.07
Issue no. 17 Overall	7.04
Issue no. 17 Cover Art	6.66
Short Rounds	6.60
Medical Department	6.21
Iran Hostage Rescue	6.13
Next Japanese-American War	5.95
Commentary	5.69

Nineteen percent thought no. 17 was better than no. 16; 23% claimed the opposite; an even 50% maintained the two were of about equal worth, and 8% of the readership of no. 17 hadn't seen no. 16, and so couldn't judge between the two.

Without any doubt, the big generator of written feedback was Jeffrey Addicott's "Commentary" piece on Schwarzkopf/Lee/Sherman. (Phew!) And, also without any doubt, those comments could be broken into two broad categories: those from Union men, and those from Southerners.

The latter viewpoint was probably best summed up by one man who wrote: "It was wonderful to read an article by someone who could explain such an important point about the two sections' shared history in so thoroughly modern a context."

The pro-Federal viewpoint was usually expressed more pointedly, as typified by the fellow who wrote: "You know, when it comes to the Civil War, *Southerners still just don't get it* " (emphasis in original). Who says history is dead?

As to your World War II preferences, 29% of you favor the Western/Mediterranean theater; 37% like the Eastern Front, and 34% picked the Pacific. Next issue we'll dip back into the era-preference data to see if there've been any big shifts since last year.

Ty Bomba

Editor, *Command Magazine*

SHORT ROUNDS

Mysteries Revealed. . .

"A Calculated Risk"

In November 1943, the 10,000-ton Liberty Ship *SS John Harvey* was loaded at Baltimore with 2,000 M47-A1 100-lb. bombs. Each bomb, just over four feet long and eight feet in diameter, held 65 lbs. of mustard gas. Six members of the Army's Chemical Warfare Service were also on board.

The *Harvey* and her cargo were part of what had become standard practice for both the Allies and Axis. Convinced chemical warfare might break out at any time, both the Allied and German high commands faced the dilemma of how to prepare for it while not looking as if they were planning to initiate it.

Throughout the war, both sides kept supplies of chemical weapons near the various battle areas. All such dumps were shrouded under the greatest possible secrecy. The (again, mutual) fear was that if the other side found out about the existence of such stockpiles, they might use that as a pretext for launching chemical attacks of their own.

The *Harvey* was only one of a number of transport ships used to make sure U.S. forces in Italy had a sufficient stock of chemical armaments on hand in case the Germans or Fascist Italians attempted to use similar weapons to slow Allied progress.

As the ship made its way toward Bari, on Italy's southern Adriatic coast, the Chemical Service men on board had plenty to occupy their time and thoughts. Fashioned using the cheap and speedy "Levinstein H Process," American mustard gas was notoriously unstable. That process also contaminated the mustard gas inside the bombs with up to 30 percent impurities. Those other gases could build up inside the casings and cause explosions. Consequently, the bombs had to be vented regularly, and the casings constantly inspected for any signs of erosion.

On 28 November, the *Harvey* arrived at Bari, where the harbor was already choked with other, more conventional Allied shipping. Forbidden by orders to reveal its cargo to port authorities, the supposedly "standard" supply ship was directed to tie up at a pier, there to await its normal turn for off-loading.

Four days later, on 2 December, Air Marshal Sir Arthur Coningham held a press conference at which he announced the Allies had achieved total air supremacy in the skies over southern Italy. At 7:30 p.m., 100 Ju88 bombers, their pilots flagrantly ignoring Coningham's announcement, roared in over Bari and inflicted on the Allies their worst seaport disaster since Pearl Harbor.

In 20 minutes the *Luftwaffe* bombers sent 17 ships, carrying some 90,000 tons of supplies, to the harbor floor. Shortly after 8 p.m., a fuel ship anchored next to the *Harvey* exploded with enough force to shatter windows in buildings seven miles away. A few moments later, an explosion tore through the *Harvey*, which began to list and sink.

Some of the mustard went straight to the bottom, but other cylinders began to burn. Then the deadly cargo began to leak out of the ruptured hold and spread through the debris-filled harbor. There it mixed with the hundreds of tons of oil that had leaked onto the surface during the attack. A strong odor of garlic soon hung over the water. Slowly a dense cloud of black smoke mixed with the gas and rolled over the nearby town.

The worst was suffered by the men actually in the water, sitting in puddles of oil in life rafts, or hanging on to pieces of floating debris. Their entire bodies were immersed in a solution of mustard and oil.

The rescue teams in the harbor and at the hospital in Bari had no idea mustard gas was aboard the *Harvey;* everyone on board her had died in the explosion. The hospital was soon overwhelmed with 800 wounded (1,000 others had already died). Assuming most of the men were suffering from simple exposure, the harried staff made no attempt to decontaminate them. Still wet and covered in crude oil and mustard, most were simply wrapped in blankets and given warm tea. They sat or slept quietly that way for the remainder of the night.

Those men, of course, had unknowingly been dipped in a solution of mustard-in-oil. The blanket-wrapping did nothing more than allow them a prolonged period of absorption. Inadvertently, precisely the wrong things had been done for them.

By morning, the first of about 630 mustard gas victims began to complain they were blind — their eyelids had swollen to several times their normal size. As the day progressed, appalling burns developed. Surface skin layers came loose in strips, as large blisters, themselves filled with mustard agent, burst. Some men lost 90 percent of their skin in the days that followed. Seventy of them died.

Out at sea, the destroyer *USS Bistera,* which had picked up 30 survivors before dashing out of the harbor, was also having serious difficulties. The vapors from the mustard agent clinging to the men, as well as that which had gotten on the ship's decks, was having an effect. Her officers and crew were almost all totally blind and severely burned. It was 18 hours before the crippled crew was able to guide the ship into Taranto harbor.

In Bari itself there were similar scenes of misery. More than 1,000 civilians were killed in the attack and its aftermath. At least 25 percent of them died as a result of the great mustard cloud which had billowed over their town. Others were coated with the agent after being swamped with the oil-mustard waves that soon covered the seafront. Thousands more fled the town, spreading stories of war gasses throughout the countryside as they went.

After first attempting to clamp a lid of secrecy on the fiasco, the Allied high command finally admitted a chemical weapons incident had occurred. Gen. Eisenhower, in his press release of 2 January 1944, explained that "Allied policy is not (repeat not) to use gas unless or until the enemy does so first, but we are fully prepared to retaliate and do not deny the incident, which was a calculated risk."

In May, Allied commanders were directed to inform their medical officers when and what stores of gas weapons were in their localities. In the meantime, sufficient chemical agents had been placed within easy reach of the *5th Army* to allow it to conduct full-scale chemical warfare, if the need arose, for 45 days (and even more was enroute to England to support Operation Overlord). The "calculated risk" was continued by both sides for the rest of the war.

— David Tschanz

Might've Beens. . .

Plan 1919

Had World War I continued, the Allies intended to launch a final offensive in the late spring of 1919. No official operational plan for the assault was ever adopted, but one visionary proposal from the British tank expert J.F.C. Fuller was given serious consideration.

In May 1918, Col. John Fredrick Charles Fuller, then a senior staff officer in the Royal Tank Corps (RTC), submitted a paper outlining his ideas for an Allied offensive in 1919. Given the title "The Tactics of the Attack as Affected by the Speed and Circuit of the Medium D Tank," it became better known simply as "Plan 1919." Although circumstances prevented it from being put into effect, it was a historic document in that it laid the foundations of modern armored warfare.

Fuller had joined the RTC at the end of 1916, following the first use of British armor in the waning days of the Somme Offensive. There he worked to develop the tactics used a year later, when the Corps spearheaded the British assault at Cambrai.

That push succeeded (albeit only briefly) in achieving the long sought breakthrough on the Western Front. Confused objectives, lack of reserves, and heavy losses among the tanks (mostly due to mechanical breakdown) prevented the British from exploiting their initial success, and a ferocious German counterattack soon ended the battle. But the tanks had clearly proved their usefulness. Even officers as unimaginative as Haig came to embrace them as vital infantry support weapons.

At Cambrai the British used their tanks as a means to enable their infantry to advance; by the time Fuller had written "Plan 1919," he intended the RTC to operate independently. Tanks were no longer seen as just a technological solution to the specific problems of trench warfare. Instead, they were now to play the main role in battle, with the infantry relegated to a supporting function. (After the war Fuller became even more radical, suggesting infantry be eliminated entirely as a modern combat arm.)

Fuller's ideas had been given impetus by two developments, the first of which was technological. The tanks used at Cambrai, principally the Mark IV, had a top speed of 3.7 (three point seven) mph under ideal conditions. They were also mechanically unreliable, and had only a limited operational range. By the spring of 1918, however, the British had introduced an upgraded version of the Medium A tank, the Medium C (known as the "Whippet"). This machine was a considerable improvement over its predecessor in both speed (8-12 mph) and range.

That improvement encouraged Fuller to discuss with the RTC's engineering department the possibility of further upgrading the Whippets into a tank truly capable of fulfilling the decisive battlefield role he envisioned for them. The "Medium D" was to have a speed of 20 mph, a range of 150-200 miles, the ability to cross trenches up to 14 feet in width, and an amphibious capability great enough to allow it to ford small rivers. The engineers assured the Colonel such machines could be produced in sufficient numbers in time to conduct offensive operations in 1919.

The other key to Fuller's evolving theory of armored warfare was provided by the enemy. He carefully studied the new "infiltration tactics" used by the Germans in their spring offensives of 1918. With them, the Germans abandoned the prolonged bombardments and mass frontal assaults of the previous four years. In their place, the new doctrine substituted surprise, by the use of short but intensive artillery barrages, and mobility, through the commitment of specially trained light infantry units (the famed *Stosstruppen,* or "Shock Troops").

The Shock Troops' job was to find (or create) gaps in the enemy defenses, and then "infiltrate" through them to destroy vital points in the defenders' rear areas. Emphasis was placed on overrunning enemy artillery, supply depots, rail lines and headquarters.

It was the effectiveness of the *Stosstruppen* in disrupting the British command network that particularly impressed the tank man. Fuller noted how units whose headquarters had been eliminated were quickly reduced to a state of operational impotence (even though otherwise still intact). Cut off from higher direction, whole battalions surrendered to mere handfuls of Germans. An army deprived of the ability to give and receive orders, he concluded, was like a man "shot through the brain."

In essence, "Plan 1919" adopted the German tactics, replacing the *Stosstruppen* with the new Medium D tank. Fuller also refined the German techniques and broadened the scope of their application. In doing so he created a blueprint for a massive mechanized operation, one that was to be conducted on a scale far greater than any of the 1918 offensives. Operation Michel, the largest of the German drives, had been launched on a front 43 miles long. "Plan 1919" doubled that, calling for simultaneous blows on a 90 mile front.

None of the leg-propelled *Stosstruppen* attacks had been able to sustain their initial momentum for long. Fuller, utilizing the greater and more sustainable mobility provided by tanks, intended his offensive to drive a minimum of 20 miles a day, for 5-7 consecutive days.

After selecting the particular sectors to be attacked (based on their strategic importance and the suitability of the terrain for mechanized operations), elaborate deception measures were to be taken to attract German attention to other areas of the front. This was intended to draw away the enemy reserves from the actual points of attack.

"Plan 1919" also called for the use of 5,000 tanks, more than 10 times the number used at Cambrai. Fuller wanted to organize that mass into 30 brigades, subdivided into 90 battalions. But the formation of actual armored divisions was left only implicit. That omission may have been deliberate, in order to at least partially disguise the plan's radical nature and thus ease its acceptance by a still-conservative high command.

The offensive was to unfold in three stages. First, 2,592 heavy tanks and 390 medium tanks (of all types) would breach the main German defense line. Next, 790 Medium D tanks would pour through the gaps just created. Their targets would be the enemy headquarters (the locations of which were to have been previously pinpointed by aerial reconnaissance). Every German division, corps and army headquarters behind the front was to be attacked. The German command network would thus be destroyed, and their defense paralyzed.

At that point the battle would already be won. However, a final force of 1,220 medium tanks, supported by cavalry and tractor-carried light infantry, would initiate and maintain a vigorous pursuit.

Aircraft were also to play a prominent part in the battle. In addition to acting as scouts, during the second (or "disorganizing") phase, "every available bombing aeroplane would concentrate on the various supply and road centres," in order to complete the disruption of the German defense. Finally, fighters were to strafe the retreating enemy columns during the climactic "pursuit" phase.

Unlike the air forces and tanks, the infantry were given only limited tasks. Their main job was to round up the expected large numbers of prisoners, and to occupy captured ground. Little, also, was expected from the horse cavalry. In fact, Fuller seems to have included them in the pursuit phase mainly to gain the support of the many "horse worshipers" still in the British command.

The plan was given preliminary approval by the Imperial General Staff on 20 July 1918, shortly after the failure of the final German offensive, and was then brought to the attention of Marshal Foch, Supreme Commander of the Allied Armies in France. The Frenchman was always willing to consider any method of attack, but he was already looking for ways to win the war that year, and so never rendered any final decision on the Fuller's document.

Despite the approval of the British staff, and Foch's initial enthusiasm, it is by no means certain "Plan 1919" would have been put into effect. It was Haig, not Foch, who finally would have been responsible for its execution, and his view of the tank remained deeply conservative: "Tanks do not in themselves possess the power to obtain a decision, their real function being to assist the infantry to get to grips with their opponents."

Haig was willing to refight Cambrai, this time on a larger scale and with a greater allocation of resources, but Fuller's marriage of armor, infiltration and exploitation was too revolutionary for him to accept. Assuming Haig retained his command, the fate of "Plan 1919" may well have rested in unsympathetic hands.

The differences in outlook between Fuller and Haig went beyond their ideas on the proper uses of the tank. Haig felt the course of the war had vindicated his strategy of attrition, wherein the enemy's will was broken by inflicting massive losses. To accomplish that, a commander could not and should not try to avoid having his own forces suffer heavy casualties.

Fuller disagreed. He postulated that a mechanized army, striking deep into the enemy's rear areas to disrupt his supply, communications and command, could bring victory without costly frontal assaults. Future wars, according to the new doctrine, belonged not to the strongest, but to the most agile.

In sum, the future proved both men correct in some ways. That is, in the campaigns of 1939-41, Germany put into practice the theory outlined in "Plan 1919." In the end, though, World War II also became another struggle largely resolved by material and human attrition. Fuller's ideas changed forever the nature of combat, but not the ultimate costs of war.

— Ted S. Raicer

Firsts. . .

The Man Who Invented R&D

We have all heard of the "military-industrial complex," against which President Eisenhower warned us. Curiously, we also know who started it. In 399 BC, the *tyrannos* (or dictator) of Syracuse, in Sicily, Dionysios the Elder, determined to conquer the Phoenician city of Motya, at the island's western end. According to one ancient chronicler, for that enterprise, he "gathered skilled workmen . . . attracting them by high wages from Italy and Greece as well as Carthaginian territory.... He divided them into groups in accordance with their skills, offering great bounties to any who created a supply of arms."

Thus Dionysios became the first known ruler who hired experts to invent deadlier weapons and who organized them into research and development teams. He lured engineers from around the Mediterranean, entertained them with wine, women and song, and told them to invent things with which to beat the Carthaginians. His technicians developed not only the first ships with more rowers than the standard trireme, but also the first catapult.

When the Syracusans defeated the great Athenian invasion of 413 BC, Syracuse was enjoying one of its brief fits of democracy. Born into a bourgeois family of modest means, Dionysios got a job as a clerk in a public office and joined the faction of Hermokrates (the man who had led the city against the Athenians). From there, Dionysios' career showed all the brilliance, daring and villainy that would characterize princes of the Renaissance, 1,500-2,000 years later.

When Hermokrates seemed to grow too powerful, the Syracusans voted him into exile. When he later tried to use force to return, he was killed in a riot; Dionysios was wounded and left for dead. When the political dust had finally settled, Dionysios, who had meanwhile wed the dead Hermokrates' daughter, emerged as a new and popular leader. He persuaded the citizenry to dismiss the ruling government and appoint a new one, which included himself.

Then he staged an attack on himself, and demanded the people vote him a bodyguard for protection. Once he had his own battalion of armed bully boys, it was easy to seize control of the public buildings and proclaim himself *"Strategos Autokrater,"* and kill his remaining opponents. His favorite method for executions was drowning.

In power, Dionysios fought indecisive wars with the Phoenicians of Sicily and Carthage. After a failed attempt to relieve a Carthaginian siege of Gela, the aristocratic cavalry got home first and vented its displeasure with the general-autocrat by gang-raping Dionysios' wife. During the crime or soon after, sources aren't certain, she died or killed herself. Dionysios, of course, soon took vengeance on the foolish mutineers.

The dictator then spent several years fortifying Ortygia, an island adjacent to mainland Syracuse (and now joined to it), and building harbor works. Intensely suspicious (by then with good reason), he let only supporters and mercenaries live on Ortygia, wore an iron vest beneath his robes, and refused to let a barber near him with anything sharp.

Grim as the above sounds, Dionysios was liberal in granting citizenship to foreigners and ex-slaves. But he also ruthlessly uprooted the inhabitants of other Sicilian cities and moved them willy-nilly to Syracuse. As a result, the population soon topped 250,000, making Syracuse perhaps the largest city in the world at the time.

Though Greeks were normally monogamous, Dionysios defied convention by marrying two well-born young women at the same time and begetting children with each of them.

Dionysios' New Ships

We have but a sketchy idea of the evolution of ancient ships, because classical literary sources give few details. (The earliest-known book on shipbuilding dates from A.D. 1536, from Henry VIII's England.) We do know, however, that the ancient shipwright trade was carried on by rule of thumb, passed down orally through tight-lipped guilds and families.

In Dionysios' time, the trireme was the standard Mediterranean battleship. Triremes (or *trieres*, "three-ers") had oars of uniform length arranged in three banks, with one rower to each oar, sitting in a staggered arrangement. We may guess that Dionysios' shipwrights first tried rearranging oars into four or five banks of one-man stations, but soon found it wouldn't work. The upper oars would have had to have been longer than those lower down, and no crew could have kept such a bristling mass of non-uniform oars sweeping in unison.

Then, probably, someone thought of putting more than one man on each oar. That made combinations possible. A quadrireme (*tetrere* or "four-er") might have had three banks, with two men on each upper-bank oar and one on each middle or lower; or two banks with two men to each oar; or one bank of four-man oars. (Some authorities believe the Romans later favored a quinquireme with one bank of five-man oars. The Byzantine *dromon* of the West European "Dark Ages," was a two-banker with a lower bank of one-man oars and an upper of two- or three-man oars.)

The three-and-a-half centuries after Dionysios saw an arms race to build super-galleys much like the battleship development of the 20th century. In both cases, the warships in question reached their developmental climax just as they were becoming obsolete. The greatest galley ever was a "forty-er," built for Ptolemy IV, and propelled by 4,000 oarsmen. It was probably a catamaran, with two hulls joined by a common deck.

Each hull would have had three banks of oars on each side, with each oar manned by five to eight rowers.

That sluggish monster never fought and didn't prove cost-effective. For one thing, classical-age rowers were generally *not* slaves, but fairly well-paid freemen. To hire the forty-er's 4,000 oarsmen must have strained even the wealth of Ptolemaic Egypt. At any rate, after Actium, ancient naval actions were mainly confined to chasing pirates, which didn't require the use of such huge and costly ships.

Catapults

We know more about the development of the catapult, thanks to surviving works from five classical authors. Those ancient treatises, though, still leave much to be desired, and their copied and recopied diagrams are barely decipherable. We can be sure, however, that Dionysios' catapult looked like a large crossbow mounted on a pedestal, shooting a six-foot arrow. Since the bow was too stiff to be bent by any man's hand, the engineers worked out an ingenious system for cocking.

The catapult's stock was crafted from a large beam (the *syrinx*, or trough), with a wide and deep groove in its upper surface. In that groove lay a smaller beam (the *diostra*, or slide), also with a grooved upper surface, and free to move back and forth. The after end of the slide bore a bronze crosshead with a hook to catch the bowstring, a trigger mechanism, and a pair of pawls to engage ratchets on the stock.

The slide was pushed forward until the hook engaged the string. Then the slide was pulled back by a winch until the bow was bent. The pawls engaged the ratchet teeth and kept the bow from pulling the slide forward again. The dart or arrow was placed in the groove of the slide in front of the string. When the string was released, away went the missile.

Dionysios took his catapults to Motya and captured the city. His darts, whistling down at long range on the ships of a relieving Punic fleet, turned back the astounded Carthaginians.

Later, one of the six-foot arrows was taken to Sparta as a curio. When King Archidamos III saw it, he cried: "O Herakles, the valor of man is extinguished!" Thus uttering the first recorded protest against the mechanization of war.

Philip II of Macedon and his son Alexander eagerly adopted the new weapon, and catapults evolved swiftly. Large ones, with a leather strap or pouch in the middle of the bowstring, threw balls of stone or brick weighing up to three talents (180 lbs., or 80 kilos). Smaller catapults were mounted on pivots or swivels, so that the butt of the stock could be moved up and down and from side to side for aiming.

Ancient catapults were credited with ranges over 600 meters. Modern catapults built according to ancient plans have shot 18-inch darts 370 meters, and 27-inch darts 305 meters. In comparison, the maximum effective range of a military bow is about 150-175 meters (bows can shoot farther, but only with light, non-military arrows).

During the Hellenistic Age, from Alexander to Julius Caesar, catapults proliferated. City walls of brick had to be replaced by stone to resist the new artillery. All those pieces were indiscriminately called "catapults" and "ballistas," both from the Greek for "thrower" or "shooter."

Dionysios' End

After Motya, Dionysios fought more Carthaginian wars, with some successes and some defeats. Eventually he extended his power over southern Italy, campaigned against Etruscan pirates, and by the end of his life, in 367 B.C., ruled more Greeks and Greek territory than anyone before Alexander. (He also cherished literary ambitions. One telling has it that he died from overindulgence while celebrating the first prize won by one of his plays, *Hector's Ransom*, at a drama festival in Athens.)

Dionysios' chosen successor, Dionysios the Younger, proved a nincompoop who spent his last years in exile, teaching school in Corinth. So, while the empire of Dionysios the Great was short lived, in the long run he exerted a vast influence on history by having conceived the idea of organized military research and development, leading to our own era's military-industrial complex.

— L. Sprague de Camp

[Ed's Note: Yes, all you science fiction readers, he's the same L. Sprague de Camp you're familiar with.]

Trendlines. . .

Iran Picks Up Where Iraq Left Off

In late May of this year, Syrian army officials informed the families of four of its members their son/husband/father had been killed in a "military accident." The location of the mishap was not announced to the grieving relatives.

Syria has never officially acknowledged it is assisting in Iran's missile development program, so those families were not informed their men had perished in Tehran, where they had been working on a project to extend the range of the Islamic Republic's SCUDs.

In addition to modifying the range and accuracy of their existing store of SCUDs, the Iranians have ordered 130 upgraded SCUD-D missiles from North Korea, at a cost of $320 million, and took delivery of their first consignment through the port of Bandar Abbas in April.

Those new SCUD-Ds perfectly satisfy Iran's two basic weapons specifications: 1) they have a range of about 1,000 miles — they are capable of reaching Israel; and 2) each can be armed with a non-conventional warhead.

Some intelligence sources also believe Iran has acquired two nuclear artillery shells from Kazakhstan, one of the four former Muslim republics of the defunct Soviet Union. Each week, more reports are coming into the Western intelligence community indicating Iran is continuing to build its military strength.

During the height of the Coalition-Iraq Gulf War, Iran received an unexpected addition to its air force's inventories when Iraqi pilots flew 48 military and civilian planes to that nation, under the pretext of escaping the US air blitz. Those planes are now fully integrated into the growing Iranian air service.

Further, last year alone, as part of a $10 billion oil-for-arms deal, Moscow transferred $1 billion worth of high-tech weaponry to Iran, including 160 MiG-29 fighters, SU-24 fighter-bombers, SA-5 surface-to-surface missiles, T-72 tanks, and a generous assortment of artillery pieces. All that hardware, however, impressive as the list may be, amounted to only half of Iran's military acquisitions during 1991.

This year, Iran will take delivery of a further $1 billion military consignment from Russia. Part of this new order will include three diesel-powered submarines. This acquisition is an attempt by Tehran to gain the ability to threaten free passage through the Strait of Hormuz, the narrow bottleneck through which all shipping must pass to enter the Persian Gulf.

The new sea and air assets Iran is integrating into its defense system will be manned by over 500 pilots now being trained in Russia, and an equal number of Iranian sailors receiving instruction at a submarine base in Latvia. (With the end of the Cold War, it is no longer ideology driving the ex-Soviet republics to supply Iran with weapons. Rather, it's simple economics. That is, the need of the new republics to generate income from *any* sources is what is dictating the course of much of the world arms trade today.)

Communist China is yet another player in this scenario. Peking is selling Iran a fleet of fast patrol boats armed with STYX and cruise missiles.

In the area of nuclear development, Western analysts are convinced the Islamic Republic is engaged in an all out drive to create the facilities needed to make their own atomic arsenal. Six nuclear research sites have been identified in the country, and there are reports China and India are assisting in Iran's nuclear-related technologies program. The research locales are said to be at Muallam Kaliyah (north of the capital), Isfahan (south), Kharj (in Tehran), Bushir, and the holy city of Mashad.

Speculation is that Tehran's ultimate purpose in all this is twofold. First, the Mullahs want to extend their military, political, and religious hegemony throughout the Gulf area (they've already announced territorial claims on Bahrain). Second, they want to consolidate a leadership role throughout the Muslim world, by putting real force behind their repeated calls for the destruction of Israel. (Iran has not supported the current peace initiatives, and continues to promote attacks against the Jewish state by the surrogate forces of the Hizbollah and Islamic Jihad in southern Lebanon.)

Thus, less than two years after the conclusion of the 100-hour War against Iraq, another Middle Eastern power is gathering its strength for an attempt to gain control of that part of the world. This time, though, it appears the new contender intends to move to impose its will only after it has nuclear weapons capability — a delay intended, of course, to inhibit or forestall any reaction by Israel or the West.

— Arnold Blomberg

Humor. . .

From the Old Kitbag

The following song (sung to various tunes) was popular throughout the British army on the Western Front during 1917-18.

Bombed Last Night

Bombed last night, bombed the night before,
Gonna get bombed tonight if we never get bombed no more.
When we get bombed, we're scared as we can be.
Oh, God damn the bombin' planes from Germany.
Their over us; they're over us!
One shell hole for the four of us.
Glory be to God, there are no more of us,
'Cause one of us could fill it all alone.

It also had this variant:

Gassed Last Night

Gassed last night, gassed the night before,
Gonna get gassed again, if we never get gassed no more.
When we're gassed, we're sick as can be,
'Cause phosgene and mustard is too much for me.
They're warning us, they're warning us!
One respirator for the four of us.
Glory be to God that three of us can run,
So one of us can use it all alone.

— Robert Mosher

The Russo-Japanese War, 1904-1905

The Land Campaigns

by Ron Bell

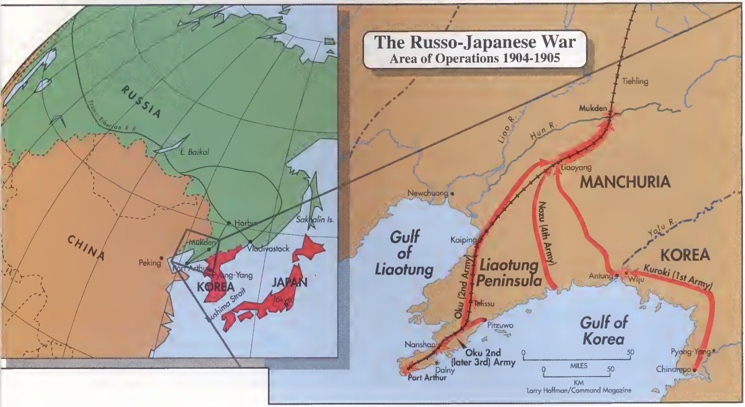
Around the turn of the century, two short wars occurred within seven years of each other that set the stage for all that has since followed in the Pacific. Together they heralded the passage of an old order and the coming of a new one.

The first was the 1898 emergence of the United States onto the international scene in the Spanish-American War. In the US today, most educated people have at least a passing acquaintance with that conflict. San Juan Hill, "You may fire when ready, Griddley," the Rough Riders, Teddy Roosevelt, etc., are all names and phrases that have a familiar ring to American ears. However, those same people generally know nothing of the events or stakes involved in the other conflict, the Russo-Japanese War of 1904-05. Yet that second fight was one that saw the rise to great power status of one of the two greatest enemies Americans were ever to fight in a declared war — Japan.

The origins of the Russo-Japanese War were not rooted in the distant past; it did not result from centuries of competition and strife. It was only in 1830 that the Cossack Yermak led his freebooting band across the Urals and extended Russian influence to the shores of the Sea of Japan. Thirty years later, Russia forced a treaty on China that awarded the Czar the coast of Manchuria, renamed the Russian Maritime Province. By 1875, Russian boats and ships were a common sight in northern Japanese waters. That same year, they seized Sakhalin Island.

Japan, meanwhile, was struggling to move itself into the present. Her leaders knew such a change required heavy industry, but the necessary natural resources were not available in the home islands. When they began to look elsewhere for those materials, they saw the Western powers closing in around them.

The only resource area both close and still ripe for picking was Korea. Ostensibly a semi-autonomous kingdom within the Chinese Empire, Korea was in reality independent, as central



Larry Hoffman/Command Magazine

authority in Peking was ever harder pressed merely to control its own environs. In 1894, Tokyo used a series of internal disturbances on the peninsula as an excuse to intervene there. The resultant war was over quickly — the Japanese got all they wanted, or so it seemed.

Russia, the European power with territory closest to the new Japanese acquisitions, reacted by pressuring Japan (with German and French help) to give up the Liaotung Peninsula, along with the superb naval base at its tip, Port Arthur. The Japanese were also called on to recognize Korea's independence (though she was allowed to maintain forces there in a "sphere of influence").

This forced treaty revision was viewed as shameful in Japan and caused riots, which then led to the downfall of the Tokyo government. Korea and Liaotung became a *cause celebre* in Japan, much as Alsace-Lorraine was to Frenchmen of the time.

Russia continued to press, though, and by 1898 had negotiated a new treaty with China whereby she was granted a 25-year lease on Port Arthur and its surrounding territory. Russia suddenly had a warm-water Pacific port. The Japanese, of course, became even more furious. What had been won with the blood of her soldiers had just been handed over to the nation fast becoming her chief rival. The continuous build up of Russian forces in Manchuria and Liaotung made it obvious the Czar's government had no intention of ever leaving the "leased" areas. Tokyo decided on war.

Ultimately a Land War

The Japanese war plan was a fairly simple one: reconquer all of Korea, Liaotung and Port Arthur. To do that, a large army had to be put ashore on the Asian mainland and kept supplied there. Accordingly, the Imperial Japanese Navy first had to gain and maintain control of the surrounding seas. The IJN did so, in a series of smashing and startling naval victories around the Korean peninsula, culminating at Tsushima. But the naval victories could not change the fact the war could only be won on land. There the contest was much bloodier and more desperate, for both sides, than it ever was at sea.

The ascendancy of the defensive over the offensive had been established during the American Civil War, but that fight really had little practical effect on armies elsewhere. Even when the Boer War demonstrated magazine-loaded rifles and machineguns had become the arbiters of the battlefield, little doctrinal change occurred. Official infantry tactics around the world still consisted of loose versions of Napoleonic-style columns and files advancing up to the enemy's positions, there to decide matters with the bayonet. More particularly, Japan copied the then-current German system of drill, while Russia clung to the same one it had adopted early in the 19th century.

The average Japanese fighting man was well trained, motivated, a hard worker, could endure much pain and deprivation, and was fanatically devoted to maintaining his and his nation's "honor." His officers were equally well trained and motivated, and were sworn to duty to the Emperor. The Japanese army would be fighting close to home, and therefore close to reinforcements and supplies.

On the other side, the Russian army was mostly conscript. Its ranks were filled with men from ethnic groups as diverse as the geography of the Russian Empire itself. While the average Czarist infantryman was brave and hardy, his officers tended to be effete and spoiled. They were drawn from the landed aristocracy, and social position remained an important consideration in all promotions. The officer corps as a whole was not well trained, and its members were not particularly motivated to leave the comforts of the garrison for the rigors of the field.

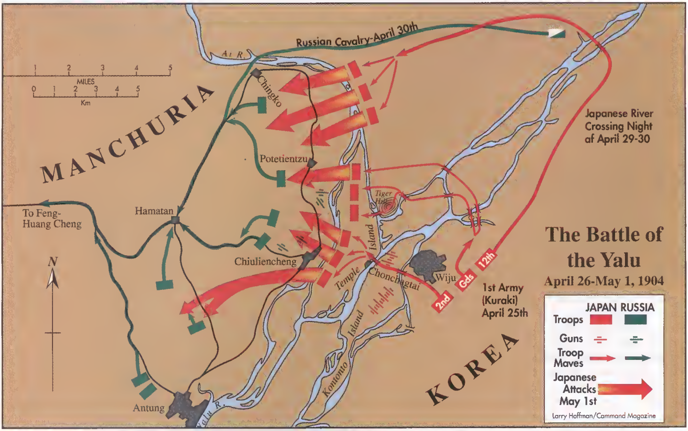
The Russian army was also at a disadvantage in that it would be fighting at the end of a 5,500 mile supply line centered around the single-track Trans-Siberian railroad. Even that route was incomplete; there was a gap around the south end of Lake Baikal, necessitating off-loading on the western shore and reloading on the other.

Beyond the geographical problems, Russia's geo-political situation also hindered the reinforcement of her army in the Far East. It was impossible to concentrate all available forces in one theater when the Russian army had to simultaneously maintain its police duties over the less enthusiastic subjects of the empire. Rebellions, or the threat of rebellions, were commonplace in Poland, Finland, Turkestan, etc., and the traditional enemy, Turkey, had to be watched as well.

The two armies were to clash in what was, even by the previous century's standards, little more than a wilderness. Manchuria and Northern Korea were extremely primitive areas; there were few roads, none of them paved. The only railroad was a spur of the Trans-Siberian that had just recently been built by the Russians to link Port Arthur and Harbin. It was stiflingly hot and humid in summer and freezing in winter. The common ground cover was a form of millet that grew everywhere, often to heights of over eight feet, in huge patches where entire divisions could get lost.

Preliminaries

Operations in the theater began on 7-8 February 1904, when Gen. Kuroki's *1st Army* began to disembark at the Korean port of Chemulpo (near modern Inchon). As soon as they were ashore and organized, Kuroki pushed his men north toward Pyong-Yang, the most important city in northern Korea. From there they went on toward the Yalu River and the border of Manchuria.



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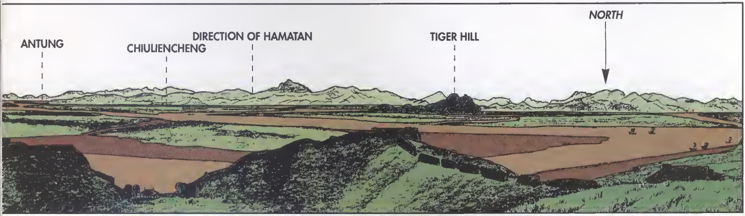
On 20 February, Alexey Nikolayevich Kurpotkin was named by the Czar as "Commander-in-Chief, Ground Forces in the Far East." As impressive as that title sounded, Kurpotkin would be subordinate to the "Imperial Lieutenant of the Far East," Adm. Alexieff. Kurpotkin arrived in Harbin, China, on 27 March, after a three-week journey across the empire.

There were already 100 battalions of infantry, 35 squadrons of cavalry, and 13 companies of engineers, totalling over 84,000 men, in his area of responsibility. But they were scattered over thousands of square miles in garrisons and remote outposts. Some were days away from the nearest transport; it would take Kurpotkin time to concentrate his army.

The Japanese ground commander, Field Marshal Oyama Iwao, had 250,000 regulars who could be augmented by another 400,000 reservists. Clearly, Kurpotkin had to play for time.

The opposing forces first encountered each other south of the Yalu, when a Cossack cavalry brigade spotted the Japanese approach to the river. The Cossacks didn't fire a shot before dashing off to make their report, and from that the Japanese concluded they would encounter no serious resistance south of the river. That assessment was correct, and the Japanese soon switched their main



View looking across the Yalu and Ai Rivers toward the Russian positions, from a temple near Wiju, General Kuroki's HQ during the battle.

port of disembarkation from Chemulpo to Chinampo, 100 miles farther north along the coast.

The Yalu

By the end of April, the Russians had 15,000 infantry, 5,000 cavalry, and 60 guns along the Yalu. Alexieff wanted the Yalu line held, while Kuropotkin foresaw fighting only a delaying action there. The local commander ended up receiving contradictory messages from both.

The Japanese themselves, of course, did not operate in any way calculated to make the local Russian commander's job easier. They prepared several crossing points to keep the man guessing, then made feints at the river mouth with torpedo boats. Soon the Russian defense was spread over 20 miles of river bank.

When the real blow came, the Japanese began it with an artillery bombardment that quickly silenced many of the Russians' (un-hidden and un-camouflaged) guns. The *coup de grace* was delivered by means of a wide flanking movement that put the Japanese across the river and behind the defenders' flank. The Russians reacted by beginning a withdrawal that would really only end at Mukden.

On the Yalu, the Russians lost 1,400 dead and 1,600 wounded, with 600 others taken prisoner. Total Japanese casualties were 1,000. More significant than anything those numbers suggest, however, was the fact an Asian army had met a European one and bested it: the world reaction was amazement. With this added to their triumphs at sea, the Japanese were beginning to seem unstoppable.

On 5 May, Alexieff left Port Arthur for Harbin, since he felt that place was now threatened both from land and sea.

Meanwhile, Kuroki moved his army forward from the Yalu toward the northwest. At the same time, Gen. Nozu's *4th Army* landed at Takushan to cover the Japanese left. Their line of advance soon took them entirely across the Liaotung Peninsula and astride the railroad that had been Port Arthur's lifeline.

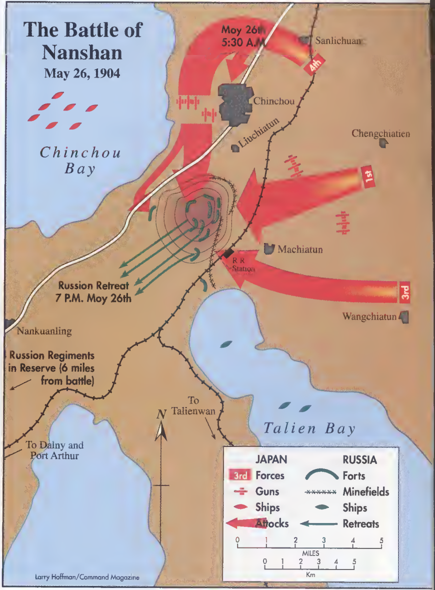
During the advance, nothing larger than battalion-level skirmishes occurred; Kuropotkin retained his army at Mukden. He had wanted the Yalu to serve only as a delaying position while he continued his concentration.

Kuropotkin was not even sure of the value of holding Port Arthur. If he evacuated, he would gain the 40,000 troops garrisoning it for use in active operations elsewhere. Alexieff, however, declared the place a fortress that must be held — it was the symbol of Russian presence and dominance throughout the region. This debate continued while Gen. Oku's *2nd Army* landed at Pitzuwo (only 60 miles from Port Arthur), marched across the Liaotung, and thus cut off the Russians to the south. Thus the question of Port Arthur's real versus symbolic importance became pointless; the Russians were faced with a siege whether or not they wanted it.

Nanshan Hill

The Liaotung Peninsula is really two land forms. It starts at Liaotung, in the north, and gradually narrows to an isthmus only two miles wide, dominated by Nanshan Hill. South of there, the area is called the Kwangtung Peninsula, on the tip of which Port Arthur was located.

In order to complete Port Arthur's close-in investment, General Oku, had to first sieze the neck of land around Nanshan Hill. The geography allowed no room for tactical finesse or deception, just straight-ahead assaults across open ground against an enemy in a fortified position on higher ground. For the mission, Oku had three divisions plus some naval gun support from minor units of the Japanese fleet.



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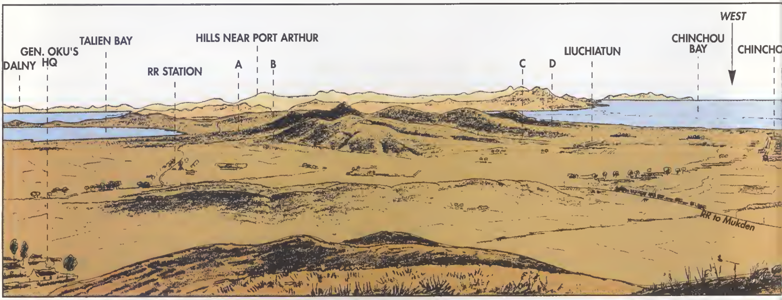


View of the Russian position at Nanshan from the Japanese HQ. "A" to "B" was attacked by the Japanese 3rd Division, "B" to "C" by the 1st, and "C" to "D" by the 4th Division.

On the Russian side, there were 10,000 men supported by two destroyers and a gun boat in Talien Bay on the east. The local Russian commander, Maj. Gen. Fock, was under the supervision of Gen. Stoessel, so his dispositions were constantly being second guessed even as the battle began to take shape. (For more on Stoessel, see the sidebar.)

Oku started his assault on 26 May with a three-hour artillery bombardment. That was superb artillery preparation by the standards of the time, but when it was over, the Russian positions did not seem to have been seriously affected.

All three Japanese divisions moved forward at the same time, using the tight, German-style formations the army had adopted. There was no cover, and the resultant slaughter was great. Whole battalions were wiped out, but the Japanese continued the assault. They eventually pushed to within 500 yards of the main Russian position, but could move no farther. They dug in and held on where they were.

The Russian position was sewn with mines. The Japanese countered by sending suicidal volunteers to throw themselves forward, thus detonating the mines one at a time and clearing a path through them. But even this desperate effort was soon aborted by Russian small arms fire from the high ground.

For seven hours one Russian division held up three Japanese. At 3:30 p.m., Oku ordered another general assault. The Russian left had shown some signs of weakening, so all the artillery was directed against it. The *4th Division* began to make some headway, getting into the Russian positions and creating some panic there when a few outlying units were flanked.

Fock reacted not by committing any of his available reserves, but instead by recommending an immediate and general withdrawal, which Stoessel approved. By 7:30 p.m., the Rising Sun flag was atop Nanshan. Oku then consolidated his position astride the isthmus and moved on to occupy Dalny. No resistance or demolitions were encountered there.

At Nanshan the Russians had lost 700 killed, against a total of 4,855 Japanese casualties. More telling, though, was the fact that out of some 18,000 Russian troops who could have been committed to the fight there, only about 3,500 were actually used. What the exact results of such a further Russian commitment against the clumsily handled Japanese attack would have been can never be known, but given the actual loss ratios, it is entirely possible the attackers could have been stopped.

At Nanshan the Japanese showed themselves to be fanatically reckless, willing to incur huge casualties in order to obtain their objectives. The Russian command could have served itself well had they taken note.

St. Petersburg called it a "strategic withdrawal," but whatever it was, Kuropotkin now had to add an isolated garrison to his responsibilities. Gen. Stoessel was cut off in Port Arthur and a siege had begun.

On 6 June, the Japanese forces in front of the Port Arthur fortress were designated *3rd Army*, and their command was turned over to Gen. Nogi. Gen. Oku turned around and headed back up the peninsula. Now three Japanese armies, the *1st*, *2nd* and *4th*, began to move north toward Liao-yang and a final showdown with the Russians at Mukden.

The Siege of Port Arthur

The Russian Defense

The siege began on 27 July 1904, when the Kwangtung Peninsula was sealed by Gen. Nogi's *3rd Army*. From that point on, the campaign in the south changed; the days of maneuver had ended. The front settled down into trenches, fortifications, set piece assaults, heavy artillery bombardments, barbed wire and machineguns.

The Russian lines were twelve miles long and five miles deep. Dotted throughout it were fortresses and battery sites, some dating from the last time the place had been defended, then by the Chinese, in 1894.

Beyond the fact most of the forts were sited on hills, there was no real plan to the defenses. There had been one, but it had been constantly modified and curtailed as the money for it was diverted to Dalny to make it a civilian and trading showplace. The use of concrete was thus limited, and the result was the positions were not proof against the heavy Japanese siege guns.

If the fortress itself was a slapdash thing, its command system was even worse. Lt. Gen. Stoessel was in command of the "fortified zone." In the port, Lt. Gen. Smirnov was the "Commandant of the Fortress." When the Russian mobile units in the area retreated to Port Arthur, the Czar ordered Stoessel himself to leave the place by ship. Stoessel, however, ignored the order, remained at Port Arthur, and claimed the overall command for himself, since his date of rank was senior to Smirnov.

Stoessel then gave charge of the infantry forces to one officer and the artillery to another. This resulted in there being little real cooperation between the Russian artillery and infantry throughout the siege. In sum, it is a credit to the 42,000 Russian defenders of Port Arthur they held out as long and as stoutly as they did despite the jealousy and confusion rampant throughout their higher command.

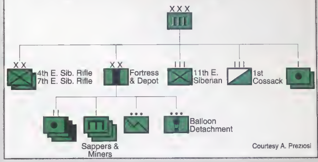
The Japanese

Gen. Nogi was the Japanese commander presented with this fine nut to crack. He had led the Japanese brigade that stormed into Port Arthur in 1894, and he was determined to repeat that performance. He did not worry about reconnaissance, or the increase in the range and effectiveness of artillery in the previous ten years, or the fact these were now Russian, not Chinese, soldiers opposing him. He is quoted as saying he was prepared to lose a division in every assault if necessary.

Accordingly, his plan was a simple one. One division would launch a diversionary attack on the right, while another drove a wedge into the Russian center. After smashing through the Russian forts, the main assault division would push on into the New Town area, steamrolling or by-passing any resistance as it went. Gen. Teshima, Nogi's artillery commander, felt confident his initial bombardment would itself be enough to destroy the various garrison units in the attacking infantry's path, and that the Japanese would prevail in this one outright assault.

Russian Forces in Port Arthur

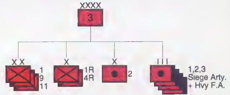
October, 1904



Courtesy A. Preziosi

Japanese Forces at Port Arthur

October, 1904



Courtesy A. Preziosi

The attack began on 19 August. All available Japanese guns were used in the bombardment, and it was said to have been the greatest artillery preparation used in war up to that date.

The first infantry attacks went in against the Waterworks Redoubt. The Japanese got within 250 yards of their objective, but had to seek cover in some abandoned trenches. Moments later 180 men sprang from those trenches to press on; only 30 got more than a few yards before being hit. The survivors crawled a few yards farther, then the entire attack stalled.

Despite the demonstration Nogi had been given about the defensive power of resolute troops in fortified positions backed by artillery, he sent his entire army into renewed attacks between 20-23 August.

It rained on the 20th and 21st, adding the twin miseries of wet and mud to all the others being suffered by the troops in the lines. Command and control in the Japanese assault groups broke down, and soon no officers higher than platoon leaders could be found who were in actual charge of their units. Conditions deteriorated so rapidly the lead elements began using the bodies of their fallen comrades to fashion crude parapets to escape the rain, mud and enemy fire.

Finally, on 23 August, Nogi halted the futile efforts. For the loss of 15,000 casualties (approximately the division he had said earlier he was willing to sacrifice), his attack had gained two outer redoubts. The overall defense of Port Arthur had not been appreciably dented.

The Japanese increasingly went below ground in their efforts to take Port Arthur. They dug parallels and trenches and saps, as besieging armies had done since the dawn of warfare. The daily tempo switched to one of minor actions and probes, as the Japanese had to take time to consolidate and heal their wounds. By 26 October, Nogi's force had lost 8,142 killed and 23, 041 wounded, about three-fifths of the strength of the entire Russian garrison.

Ironically, the slapdash nature of the Russian defenses actually worked in the defenders' favor. That is, there was not one key position, or even a handful of positions, which once taken would open a sure way in for the Japanese. The overall disorganization of the Russian position gave it a depth that frustrated structured and overly detailed attack plans.

Lacking any alternative, Nogi pushed ahead. The Waterworks, the Temple Redoubts, and Namaho Yama, with its emplaced 6-inch guns, were overrun.

Hill 203 overlooked the town and harbor; once taken, it could be used as a place from which to bombard the Russian fleet bottled up there. The first attack on the hill went in on 20 September, and was repulsed with the loss of 2,500 killed and wounded.

The arrival of six 11-inch howitzers seemed to solve the problem when their greater range allowed the Japanese to open a bombardment of the harbor without first taking Hill 203. Three Russian ships were soon struck, but the fleet commander was able to shift his units to areas obstructed from the few vantage points the Japanese controlled. The capture of Hill 203 became essential to the attackers' anti-ship efforts.

On 26 October, Nogi ordered all bombardment to shift to the trenches and forts in the northwest sector of the Russian line. The fighting there soon became hand-to-hand, with marksmanship and tactical finesse giving way to grenades and entrenching tools. After suffering 4,000 more casualties, Nogi had to call another halt. Another three forts, all minor, were the only achievements.

On 26 November, after receiving a reinforcement division, which brought his total strength up to 100,000, Nogi tried again for Hill 203. Eight days of medieval-style warfare were the result. Tunnels and counter-tunnels were used, along with clubs, knives and fists. It went on day and night until corpses covered the entire surface of the hill. The Russians eventually withdrew, only to launch two concerted counterattacks. Finally, however, on 5 December, they conceded the position to the Japanese. Russian losses at Hill 203 had totalled about 3,000; the Japanese suffered approximately 12,000 killed or wounded.

The Japanese immediately placed artillery observers on the summit and began a new bombardment of the ships in the harbor on 7 December. Within three days, five Russian capital ships, along with several destroyers, had been sunk by systematic plunging fire directed from Hill 203. The only remaining operable capital ship in the port, the *Sevastopol*, made a run for it, but was swarmed over by enemy torpedo boats as soon as she left the mouth of the harbor. Heavily damaged and listing, the *Sevastopol* limped back to the docks, where she was soon scuttled. The Russian *1st Pacific Squadron* had ceased to exist.

By this point the Russian defenses were damaged but still functional. They had plenty of food and ammunition, but also had 10,000 men in hospital, and morale had plummeted when Hill 203 fell to the Japanese. The men knew that with the big ships sunk, all the Japanese guns would soon be turned on them again, and this time for good.

From that point on, Nogi directed his assault as if Port Arthur were some natural obstacle to be overcome, and not a defended fortress. His men tunneled and blasted their way from strongpoint to strongpoint. Those they could not take by direct close assault, they blasted to bits, one at a time, with artillery and mines. As the year's end approached, the Japanese held all the high ground around the port town itself.

On 29 December, Stoessel convened a council of war inside what remained of the fortress. It was reported there was still plenty of ammunition and supplies, but there was little else in the way of good news. The *1st Pacific Squadron* had been destroyed, and there was no chance of immediate relief from any other elements of the Russian navy. Neither were the Russian land forces in the northern Liaotung anywhere near mounting a relief operation.

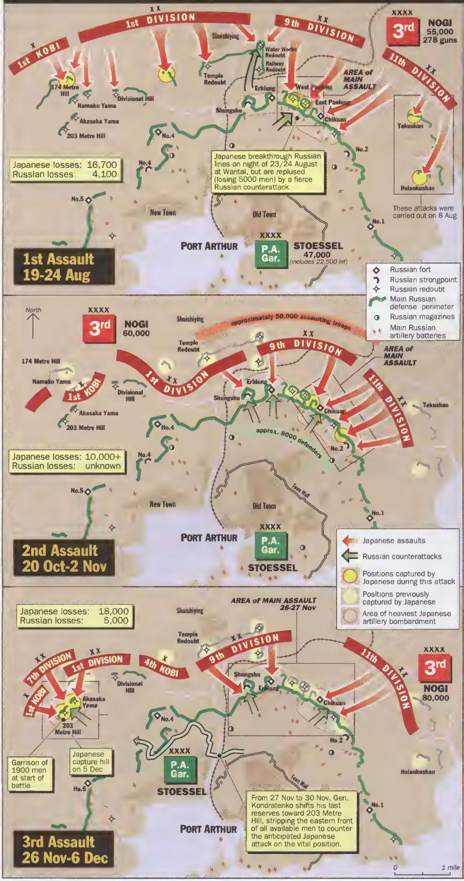
The majority of officers present at the council wanted to continue to resist, but to Stoessel the situation seemed obviously hopeless. On 1 January he sent a messenger under a flag of truce to ask Nogi for terms of surrender. By 9:45 p.m. on 2 January, the deal was signed. Many of the Russian defenders felt betrayed; as news of the capitulation spread, drunken looting of the town was the result. Stoessel had to ask the Japanese to provide a guard around his own headquarters to keep him safe from his own troops.

The main body of Japanese quietly entered the town a few days later. When they did, they found the fortress still had 600 operable guns of various calibers, 34,000 shells, 35,000 rifles, 2 million rounds of small arms ammunition, 3,000 horses with rations for a month, and 33,000 men.

The islanders were astounded for two reasons. First, they thought the place had held only 10,000 defending troops. Second, their Bushido martial code gave them no insight to understand why the Russian commander had surrendered while yet having such means for further resistance at his disposal.

The siege had cost the Russians 6,000 killed and 20,000 wounded. But the Japanese paid even more dearly, losing 14,000 killed and 36,000 wounded, with another 30,000 in hospital for sickness. In truth, Nogi's army did not swagger into Port Arthur, it staggered in.

Siege of Port Arthur: The Three General Assaults



Japanese losses: 16,700
Russian losses: 4,100

Japanese breakthrough Russian lines on night of 23/24 August at Wantai, but are replused (losing 5000 men) by a fierce Russian counterattack

These attacks were carried out on 8 Aug

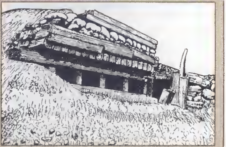
Japanese losses: 10,000+
Russian losses: unknown

Japanese losses: 18,000
Russian losses: 5,000

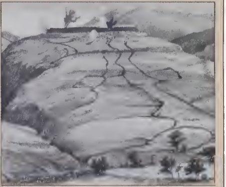
Garrison of 1900 men at start of battle

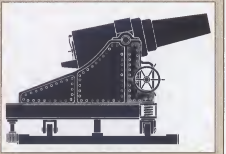
Japanese capture hill on 5 Dec

From 27 Nov to 30 Nov, Gen. Kondratenko shifts his last reserves toward 203 Metre Hill, stripping the eastern front of all available men to counter the anticipated Japanese attack on the vital position.



Top: *General Baron Nogi, although revered by his men, lacked an understanding of modern siege warfare which cost his troops excessive losses.* **Above:** *A typical Russian bombproof shelter.* **Below:** *Fort Erhlung, one of the pre-war fortifications, was an important work in the eastern defense line. In their first attack on the fort during the night of August 22, the Japanese were replused with heavy casualties.*





Eighteen of the massive 11-in Osaka coastal howitzers were used by the Japanese during the siege. Able to fire a 500-lb shell nearly 9 km, each gun weighed over 23 tons and together they fired almost 36,000 projectiles onto the Russian defenses.

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Telissu

Kuropotkin continued to concentrate at Liao-yang, preparing a line of defensive works around the town. The one thing he did not appear to be doing, however, was preparing any kind of offensive. Accordingly, back in European Russia, the Czar convened his council of war, and decreed there must be an attempt made to relieve Port Arthur.

Obediently, Kuropotkin ordered forward a force of about 30,000. He hoped it would be enough to at least draw away some of the units the Japanese had massed before Port Arthur, and perhaps even retake Nanshan. Ever cautious, though, Kuropotkin specifically ordered the offensive's commander, Gen. Stackelberg, to avoid pitched battle against superior enemy forces. Sadly for the Russians, the plan immediately leaked to the European press (which the Japanese were monitoring), so the enemy knew what was coming.

The Japanese reacted characteristically to the news by deciding on a pre-emptive attack. Oku's *2nd Army* moved north to engage Stackelberg. On 15 June, the two forces collided at the small and otherwise unimportant town of Telissu. The surrounding terrain was hilly, but neither side was favored by it in their dispositions.

The Russians fought lethargically, a style that was becoming typical for them, while the Japanese moved much more nimbly than they had at Nanshan. After three days, a Japanese flanking maneuver forced the Russians to withdraw. Through skillful use of their artillery, the Japanese were able to turn that withdrawal into a rout.

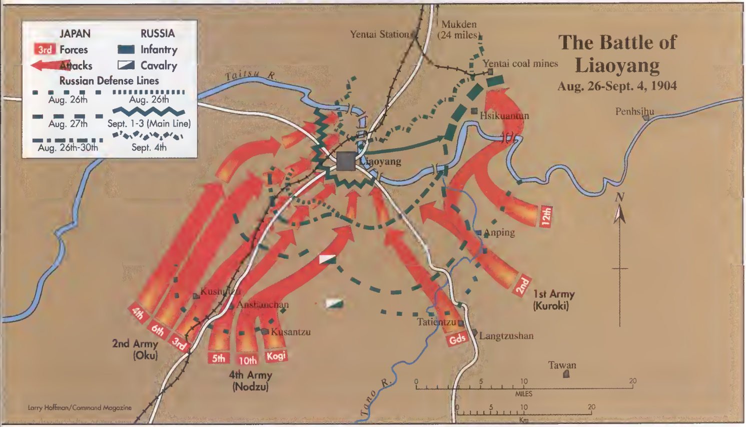
When the dust had settled, the Russians had suffered 2,500 casualties, and the Japanese 1,000. Again, despite approximately equal numbers, Asians had outfought Europeans. As Stackelberg withdrew his forces toward his starting point at Liao-yang, the Japanese resumed their advance behind him.

Liao-yang

From the very beginning of the campaign, Liao-Yang had loomed not only as the area of the main Russian concentration, but also as the final place the Japanese would have to take before pressing on to Mukden. As the days passed, a sense of inevitable collision built in both armies.

The Russians occupied a line of prepared positions south of the city. They also had vast amounts of supplies cached in arsenals inside the walled town, and they had a secure supply line — Liao-yang straddled the railroad running from Mukden to Port Arthur. Just north of the town, the Taitsu River (at that time of year it ran 20 feet deep and very fast) crossed the rail line at a 90 degree angle.

The Russian position ran for 40 miles. There was a gap about eight miles wide in its center, which Kuropotkin had occupied with his cavalry.



Larry Hoffman/Command Magazine

The Russian commander had resolved to fight a defensive battle, and it seemed all the textbook advantages were in his favor. The Japanese, however, had not read that particular book.

Oyama concentrated his armies with the *2nd* and *4th* on the left, and Kuroki's *1st* on the right. The 15-mile gap between his left and right wings he screened with cavalry. His plan was to start on 25 August, with the *2nd* and *4th Armies* making frontal assaults against the Russian right. Meanwhile, Kuroki would push across the Tang River (tributary to the Taitsu) and flank the Russian line. The resulting battle broke into three distinct phases.

In the first, the Russians were pushed back on their left, enabling the Japanese to get among them in the main defense line. On the Japanese left, the Russians were also forced back, but the attackers there failed to break into the main line.

Kuroki, known as a pusher, and perhaps the most ruthless of all the Japanese commanders, drove his soldiers forward in assault after assault. The intensity of his efforts convinced the local Russian commanders they would soon be outflanked if they didn't withdraw. Their pleadings convinced Kuropotkin, and he authorized a retreat.

The 60,000 troops in the Russian center, seeing their flanks dissolving, cracked. Their sector commander, Gen. Bilderling, sent a message to Kuropotkin warning that the river behind him was still rising and if he, too, did not withdraw immediately, his force would be cut off. Kuropotkin also approved that retrograde movement.

By 28 August, the Russian left was entirely behind the Tang River; the right had fallen back toward Liao-yang but was holding more firmly.

The battle entered its second phase as Oyama decided he was no longer fighting just to win an important field of battle, but to encircle and annihilate all the Russian forces, and thus win the war. Accordingly, he ordered *2nd* and *4th Armies* to launch more frontal assaults to fix the Russians in place. At the same time, Kuroki was to continue to work around the Russian left to get behind them.

After three days of assaults against the Russian center, in which the Japanese again suffered the heavier casualties, they had pushed to where they could see the town of Liao-yang itself. By then Kuroki was across the Taitsu and posed a serious threat to the enemy left and rear. If he got to the railroad, the Russians would be effectively cut off. The curtain now rose on the third, and final, stage of the battle.

Kuropotkin could have ordered a withdrawal to the confines of the walled city itself, but he did not want to risk having a second Port Arthur on his hands. Instead, he ordered the area abandoned, and by 4 September all his men were out of the closing trap. The Japanese were still in a position to threaten the railroad, however, so Kuropotkin ordered counterattacks to forestall any further Japanese drives.

Those attacks all failed, so the Russians' only option became to withdraw farther north along the rail line to Mukden. The movement began, and what could have been another Telissu-style disaster was only prevented when the exhausted Japanese gave up their pursuit and fell to looting the city.

The battle for Liao-yang cost the Japanese 5,000 dead and 18,000 wounded, to the Russians' 2,000 and 13,000.

Again, Russian commanders had failed their troops; their will had been found wanting in all ways. But the Russian army itself still lived; Oyama had failed to cut it off. He had to pursue it deeper into Manchuria if he wanted to destroy it. The Japanese supply lines were growing longer and their troops more tired. Winter was coming. Oyama could no longer afford to trade casualties with the Russians; he lacked the manpower pool to go on replacing such heavy losses. The Russians had to be brought to decisive battle.

Mukden

On 7 September, Kuropotkin arrived back at Mukden. Noting it was less well fortified than Liao-yang and was not as good a natural defensive position, he contemplated immediately withdrawing even farther up the rail line. Fortunately, the Japanese, recovering from their exhaustion and casualties and stretching their supply lines, were pursuing slowly. Kuropotkin determined to make another stand.

Gradually gaining more confidence, on 2 October he issued an "Order of the Day," stating that the Army of Manchuria (as his force was then called) was now ready to make a "forward movement." Since the order was widely published, it wasn't long before the Japanese got a copy. Thus warned of the Russian intention to advance, they began to make preparations themselves.

Kuropotkin planned to advance with 220,000 men down the rail line and along the Japanese left. Simultaneously he would push on the center at the Yentai coal mines, and then work around the Japanese right on the Taitsu River. The plan was actually a mirror image of Oyama's at Liao-yang, but the Russian commander's orders were poorly written and left his subordinates confused as to their ultimate intent and objectives. Kurpotkin also failed to provide orders for any kind of pursuit; his considerable superiority in cavalry was left unexploited.

At the same time, Oyama's plan turned out to be much the same as his enemy's. Thus the two forces ended up attempting to push each other in what amounted to a clockwise circle.

The Russian attacks in the east at first made good progress, but the Japanese countered by pushing back in the center along the rail line. This action again threatened to cut off the Russians from their supply line. By 12 October, the Russian left had been pushed back to the Sha River, while Kuroki, on the east, began maneuvering to cut off that Russian wing entirely.

That last move was forestalled, however, when on 12 October the Russian commander on the left announced he had used up all his reserves and needed support to avoid a disaster. Kuropotkin, who had yet to commit more than two-thirds of the forces at his disposal, reacted by ordering another general withdrawal. That move continued through the 16th, with only minor engagements and skirmishes taking place all across the lines.

Both commanders paused to reconstitute their reserves, but both sides were nearing total exhaustion. Finally Oyama gave up and resigned himself to merely blocking the Russians in front of him from interfering with the Port Arthur siege; he went into winter quarters. Kuropotkin also dug in to regroup. At that point the two armies occupied trench lines running only 200-300 yards apart. The situation was a precursor to what would occur all along the Western Front in Europe ten years later.

On 25 October, the Czar accepted when Adm. Alexieff offered his resignation, and named Kuropotkin his new commander-in-chief.

For the next few months both sides sat tight around Mukden and watched the developments at Port Arthur. On 2 January 1905, that episode came to its end when the Russians there surrendered (see sidebar). This altered Kuropotkin's situation and forced a new dilemma on him. He still had numerical superiority, at least until Nogi's army made the move north from Port Arthur. He also had a secure supply line and reinforcements. The situation obviously called for an offensive, but just where and how eluded the new C-in-C.

Before launching his new effort, Kuropotkin resolved to reconnoiter the Japanese positions with his cavalry corps. Accordingly, on 8 January, he sent 6,000 troopers and six batteries of horse-artillery across the Hun River on what was to be an old fashioned cavalry raid. The Japanese responded quickly, but instead of chivalrously using cavalry to stop cavalry, they took a decidedly 20th-Century approach and committing the massed fire of their infantry formations. The raid was blocked, and little intelligence was gained.

Still, Kuropotkin felt he had learned enough — Nogi had still not moved up from the south. When the winter weather worsened, he reasoned his Russian soldiers were better suited to it than the Japanese, and so could use it to their advantage.

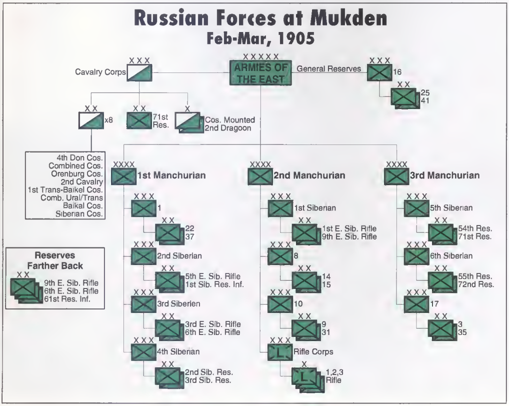
On 26 January he pushed one division across the Hun under cover of a heavy snow storm. That night temperatures fell to -13°F, and a gale force wind blew unremittingly from the northwest into the faces of the Japanese. Kuropotkin gradually increased the pressure until he soon had seven of his divisions pitted against four Japanese. When the Russian advance reached a village the Japanese had fortified and garrisoned with an entire division, however, the gathering momentum was lost.

Once again the Russian command structure failed. The local commander, Gen. Grippenberg, asked for reinforcements from Kuropotkin, which began a furious argument between the two, and resulted in the C-in-C ordering yet another general withdrawal.

Oyama, sensing the lessening pressure, decided to respond by driving the Russians as far back as possible. He counterattacked and regained all the positions lost earlier.

This time the Japanese were the winners in the casualty count, losing a total of only 9,000, compared to the Russians' 20,000 (plus another 400 lost as prisoners). A large number of those Russian losses had been wounded men left to perish from frostbite and exposure.

Oyama held a council of war to decide the next Japanese move. The resultant plans again called for a series of flank and frontal feints, which would, if all went well, result in some kind of envelopment. On 27 February, 207,000 Japanese infantry, backed by 1,000 cannon and 254 machineguns, attacked 276,000


Russian Forces at Mukden
Feb-Mar, 1905

Mukden: 21 February-10 March, 1905

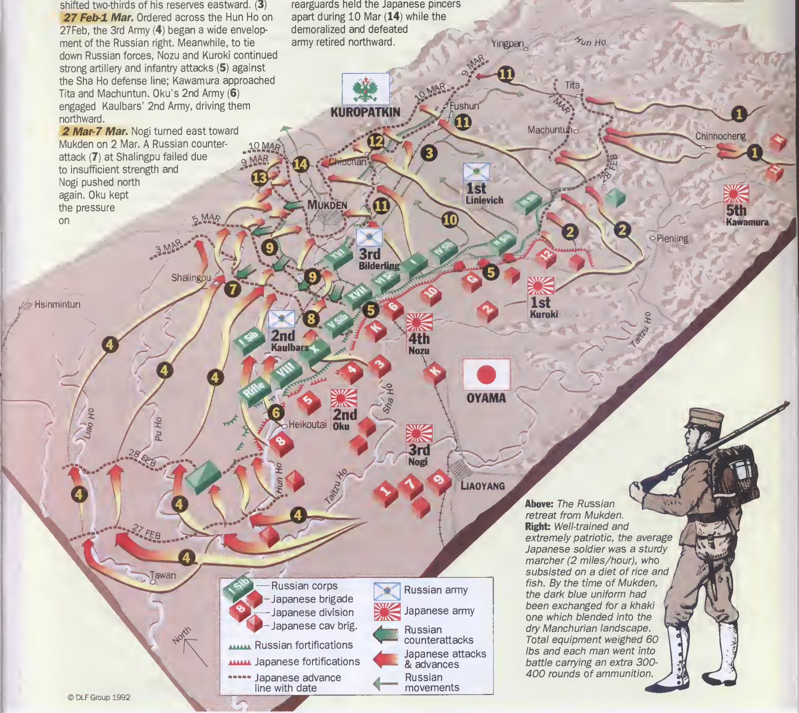
Marshal Oyama's plan was to turn both flanks of the Russian army, with the strongest descent coming from the west using Nogi's 3rd Army. This ambitious plan, by a numerically inferior force, was encouraged by the defensive attitude adopted by General Kuropatkin.

21 Feb-27 Feb. The Japanese 5th Army began the offensive on 21 Feb, moving in two columns against Tita and Machuntun (**1**) on the Russian left. Kuroki's 1st Army (**2**) soon joined, attacking the eastern flank of the Russian defenses in the Sha Ho valley, extending its line with the aim of linking up with Kawamura's left. Kuropatkin, believing this the main enemy assault, prematurely shifted two-thirds of his reserves eastward. (**3**)

27 Feb-1 Mar. Ordered across the Hun Ho on 27Feb, the 3rd Army (**4**) began a wide envelopment of the Russian right. Meanwhile, to tie down Russian forces, Nozu and Kuroki continued strong artillery and infantry attacks (**5**) against the Sha Ho defense line; Kawamura approached Tita and Machuntun. Oku's 2nd Army (**6**) engaged Kaulbars' 2nd Army, driving them northward.

2 Mar-7 Mar. Nogi turned east toward Mukden on 2 Mar. A Russian counterattack (**7**) at Shalingpu failed due to insufficient strength and Nogi pushed north again. Oku kept the pressure on Kaulbars during 3/4 Mar. (**8**) Kuroki and Kawamura made contact after forcing the mountain passes. Kaulbars attacked Nogi again on 5/6 Mar (**9**) but was repulsed. Kuropatkin ordered the retreat of his 3rd and 1st armies back to the Hun Ho, (**10**) to free forces for an attack against Nogi. An orderly retreat was completed during the night of 7/8 Mar.

8 Mar-10 Mar. By 9 Mar, the Japanese had reached the Hun Ho, (**11**) and Kuroki's army soon breached the new Russian line at Chiuchan (**12**). Simultaneously, Nogi reached for the vital railline north of Mukden(**13**). Fearing encirclement, Kuropatkin ordered a retreat. Russian rearguards held the Japanese pincers apart during 10 Mar (**14**) while the demoralized and defeated army retired northward.



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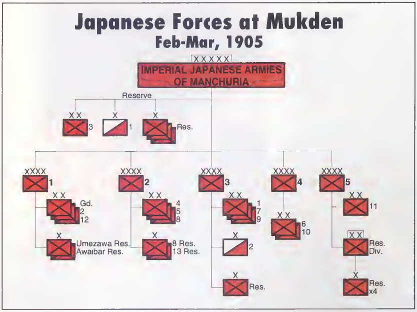
Above: *The Russian retreat from Mukden.*
Right: *Well-trained and extremely patriotic, the average Japanese soldier was a sturdy marcher (2 miles/hour), who subsisted on a diet of rice and fish. By the time of Mukden, the dark blue uniform had been exchanged for a khaki one which blended into the dry Manchurian landscape. Total equipment weighed 60 lbs and each man went into battle carrying an extra 300-400 rounds of ammunition.*



Japanese Forces at Mukden
Feb-Mar, 1905

Russians possessing 1,500 cannon and 54 machine-guns.

Meanwhile, Kuropotkin had been working up another attack plan of his own. It called for a push against the Japanese left, but when that jump off came it ran straight into Oyama's new drive. Kuropotkin, of course, reacted by calling off his own plan and began maneuvering to counter the new Japanese threat.

From 27 February to 7 March, there were in effect three battles being fought in front of Mukden. That is, the left, center and right portions of the larger engagement tended to break apart into their own separate struggles, none of which was tactically linked to the one next to it. Finally, though, Nogi succeeded in extending his army around the Russian right flank.

The weather remained as bad, if not worse, than it had been in January. There was much heavy snow and temperatures well below freezing. The Japanese medical system began to overload with casualties. On the other side, Kuropotkin was losing control of his army.

By 5-6 March, the entire front had become stationary and devolved into nothing more than a long line engaged in hand-to-hand combat. At that point the fortitude of the individual soldiers and officers in the trenches became crucial; either side might have broken and been forced to back away. Not surprisingly, it was again the Russians who gave way first. Kuropotkin tried to withdraw to Mukden itself, but the move was hindered when Nogi finally succeeded in moving around the flank far enough to reach the ever-critical rail line. The Russians ended by having to cut their way north out of what was rapidly becoming the pocket Oyama had been seeking all along.

The Japanese entered Mukden on 10 March. In the fighting just ended, they had suffered 70,000 casualties to the Russians' 20,000 (one-third of whom were listed as missing during the withdrawal/breakout). There was still a large Russian army in the field; the Japanese again had narrowly missed delivering the decisive blow. The normally stoic Japanese began to wonder where all this would end and how much it would cost them to get there.

On 16 March, the Czar relieved Kuropotkin of overall command in the east. (He was allowed to stay in the field at the head of *1st Manchurian Army*.)

Both sides were again nearing total exhaustion. There was no enthusiasm left in European Russia for this "eastern" war, and revolution seemed at hand.

In Tokyo the question arose just how far the army had to push into Manchuria before the Russians could be considered defeated. Their prewar aims had been achieved; it was only necessary to find some way to end things while they were still ahead.

The Treaty of Portsmouth

The Czar's instructions to his new C-in-C in the east ordered only that he make sure Vladivostock, the Siberian Railway, and the army's communications remain protected. No offensive action was mandated or even suggested. The new commander asked for 150,000 reinforcements; the Czar could only send 50,000.

The Japanese strained to rebuild their forces. They now had 360,000 fighting men in Manchuria, to Russia's 446,000. But the Russians in front of them were no longer the second echelon Siberians that had fought the previous year's battles. The new reinforcements were better equipped and trained and were all European formations.

The two antagonists had reached a stand off. Both made noises like they wanted to continue the fight to the end, but neither side really had any more enthusiasm. The good offices of a "disinterested third party" were needed. Britain was too closely tied to Japan, as was France to Russia, and no one trusted the Kaiser. So, by process of elimination, all turned to the other new player in the game of the Great Power politics, the United States.

President Theodore Roosevelt was secretly approached by the Japanese (and by the Kaiser) to intervene and break the deadlock. The US State Department secretly contacted the Russians and got them to agree to talk. Then Roosevelt sent public invitations to both sides to attend a peace conference. On 6 August 1905, both sides met for the first time on board the Presidential yacht *Mayflower*, and negotiations opened formally two days later.

There proved to be two stumbling blocks to a settlement. The Japanese demanded a "war indemnity" — that is, reparations. (This seemed inappropriate, since it was they who had started the hostilities.) The other issue was Sakhalin Island. The

Japanese had occupied it in what amounted to an unopposed raid at the last minute, and the Russians were understandably loathe to give it up.

After a personal cable from Roosevelt to the Czar, the Russians agreed to give up the island's southern half. The Japanese dropped the demand for reparations.

The Russians recognized the "interests" of Japan throughout Korea, and ceded them the Liaotung Peninsula and Port Arthur. (All of which, of course, the Japanese had already taken by force of arms.) Both belligerents agreed to evacuate Manchuria (except for Liaotung and the territory adjacent to the Trans-Siberian Railroad), and the Russians agreed to later negotiations to specify fishing rights in the surrounding seas. On 14 October the document was signed by both Czar and Emperor, finally putting an end to the war.

In Japan, when the treaty provisions were announced, rioting broke out. The people had come to expect more for their sons' huge expenditure of blood. The military, though, was satisfied. They had been unable to bring the Russians to decisive battle, and the situation increasingly seemed to be centering around the bottomless pit of the Europeans' reserves and unending territory. Japan's financial and material limits had been reached. To prolong the war might have resulted in a disaster for the Japanese somewhere deep in Manchuria. Their leaders were happy to quit while they were ahead, and to put off the final resolution until some later date. ✪

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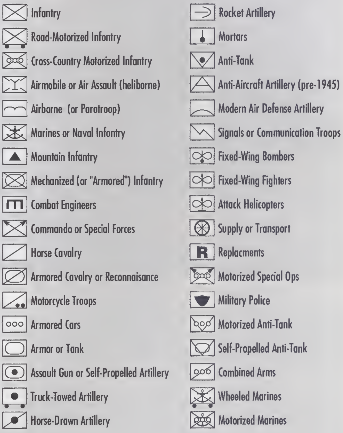
Each unit is identified by a box. The symbol inside the box indicates the unit's type, meaning the primary weaponry and equipment the unit uses to carry out its missions. Examples of unit types are:



Unit Size

XXXXXX - Theater of Operations
XXXXX - Army Group or Front
XXXX - Army
X X X - Corps
X X - Division
X - Brigade

I I I - Regiment
I I - Battalion
I - Company
● ● ● - Platoon
● ● - Section
● - Squad or Fire Team

Notes

1. If a unit symbol displays a heavy band down its left side, or a portion of its symbology is filled in, that unit is armed with "heavy" weapons. For instance, this would mean "heavy weapons infantry," while this would mean "heavy tanks."
2. If there is bracket (⌈⌉) atop a unit's size-symbol, that unit is ad hoc in nature, Meaning it was/is) not a regular organization in its army, but was created for some special (temporary) purpose or mission.
3. The number or word appearing to the side of a unit box is that outfit's numeric or name identity. For instance, this unit would be the 1st Mechanized Infantry Division.

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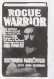

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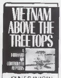

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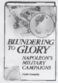

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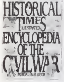

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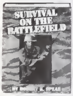

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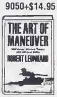

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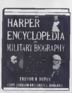

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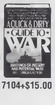

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"The Old Flag Never Touched the Ground."

by Michael J. Ryan

[Ed's Intro: This is the story of the 54th Massachusetts Volunteer Infantry Regiment *in its attack on Fort Wagner, which was also the topic of the recent movie-epic,* Glory.*]*

Crisis at Fort Wagner

On 18 July 1863, seven months after the Emancipation Proclamation, the *54th Massachusetts (Colored) Volunteer Infantry Regiment* had been selected to serve as the vanguard of the Union attack against Fort Wagner, at Charleston, South Carolina. In the blur of twilight, Sgt. William H. Carney, Jr., waited with 600 other black men to spearhead 6,000 Yankees into combat. Three-quarters of a mile away loomed the 30-foot high ramparts of the Rebel fortress.

A concoction of sand and palmetto, the area around Wagner was bordered by Vincent's Creek to the west and salt water to the east. A ditch in front of the fort served as a moat. The approaches to the stronghold narrowed 200 yards in front of that, where a defile further channeled access.

The fort's southern wall had bastions at its eastern and western corners, and inside Wagner a bombproof could shelter 900 of the garrison. Wagner was equipped with 14 cannon and 4 howitzers.

For more than a year, US forces had been trying to take the nearby city. As recently as 10 July, they had attempted to wrest Morris Island (on which Wagner sat) from the Confederates. The Yankee strategy was to take Wagner, then from it pound Fort Sumter, located 2,600 yards away in the middle of Charleston Harbor. Thus the Union would exact revenge for Sumter's surrender in 1861, at the start of the Great Rebellion.

New England Beginnings

As the men of the *54th* waited for their rendezvous with destiny, they knew they never would have made it even that far had it not been for the efforts of Gov. John A. Andrew of Massachusetts. He had written to US Secretary of War Edwin Stanton in early January 1863; and suggested the raising of a black regiment. On 26 January, Stanton replied by authorizing the governor to form such a regiment of three-year volunteers, who "may include persons of African descent organized into a special corps." In less than two weeks, Andrew had a recruiting drive under way.

The black population of all the northern states was then only about 45,000, so the new regiment could not be filled entirely from the Bay State. Recruiting offices were opened throughout the Union and Canada. Gov. Andrew also organized a bi-racial committee of prominent citizens to spur the recruiting. A Boston newspaper advertisement promised a $100 bounty, redeemable at the end of service, and monthly pay of $13, the same as white soldiers. An order from Washington soon cut the pay of black soldiers from that amount to $10 a month. The Massachusetts legislature voted to restore the difference from state funds and thus overturn the discrimination, but the insulted men of the *54th* held out for full pay from the federal government. After 18 months, their full pay was restored by Congress in 1864.

At any rate, all these efforts soon brought in 1,000 volunteers, and so a second regiment, the *55th*, was also created.

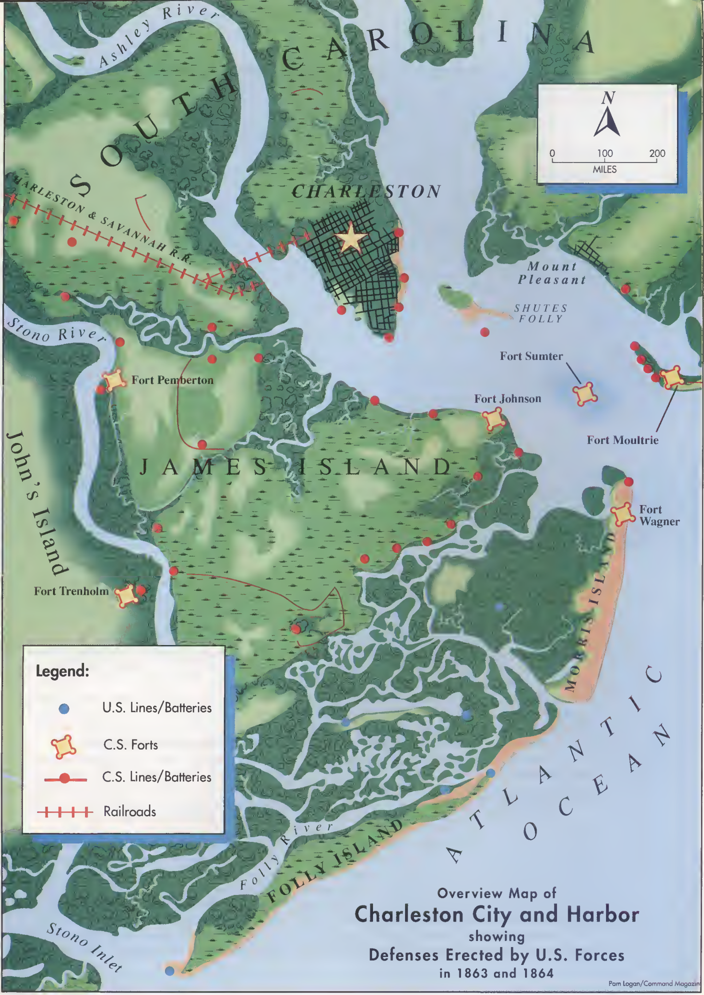
One recruiting office in New Bedford, Massachusetts, entered 75 men who formed the core of Company C. Among those recruits was William H. Carney, Jr. Carney's slave father had been promised freedom upon the death of his Virginian master. But after the slave owner died, his heirs let the earlier promise go unfulfilled. The elder Carney, along with a few other slaves, fled the plantation. With the help of the underground railroad, he escaped and settled in New Bedford, where he took employment with a family named Snow. The Snows bought the freedom of the rest of Carneys.

Frederick Douglass' sons, Lewis and Charles, were among those who flocked to the *54th's* standard. Douglass himself spoke at rallies, and through his abolitionist newspaper, in favor of the new units. He said at one such rally that Massachusetts had been the first to fight in the Revolutionary War, the first to abolish slavery, the first to admit blacks to public schools, and the first to proclaim black equality before the law.

"We can get at the throat of treason and slavery through the State of Massachusetts," he said.

Robert Gould Shaw

As commander of the *54th*, the governor selected Capt. Robert Gould Shaw, a white man and member of a prominent New York-Boston abolitionist family. Gov. Andrew had written to Shaw's father about his dream of a "colored regiment," and explained he needed a "gentleman of the highest tone and honor and I shall look for them in those circles of educated anti-slavery society,



Overview Map of

Charleston City and Harbor

showing

Defenses Erected by U.S. Forces

in 1863 and 1864

Pam Logan/Command Magazin

which, next to the colored race itself, have the greatest interest in this experiment." The elder Shaw immediately nominated his son.

Born in 1837, Robert Shaw was short and blond. His family had moved to Staten Island when he was a boy, and for two years after that he toured Europe. Before the war, he attended Harvard University for almost three years, but then quit to return to New York City and enter business. Soon after the fighting broke out, on 19 April 1861, he enlisted with the *7th New York National Guard.*

After a month with that New York unit, he accepted the offer of a commission as a second lieutenant with the *2nd Massachusetts*. Promotion moved Shaw up to first lieutenant, and then captain, by 10 August 1862.

Shaw was the kind of officer who was always concerned about his men's welfare. He even took the trouble to gather snips of hair from fallen soldiers to send home to their families. He also was lucky: in May 1862, while his unit marched through Winchester, Virginia, his gold pocket watch stopped a rebel bullet and saved his life.

In a letter dated 25 May, Shaw wrote in a letter, "You don't know how queerly the bullets sound whistling about your head. It seems as if you must surely be hit."

At Antietam his neck was cut by a shell fragment.

After that bloody day he again wrote home, "Every battle makes me wish more and more that the war was over. It seems almost as if nothing could justify a battle like that of the 17th, and the horrors inseparable."

Soon after, Shaw's father visited him in Virginia to discuss Gov. Andrew's search for a commander for the new black regiment. The young man told his father, "I would take it if I thought myself equal to the responsibility of such a position." After a little more discussion, he accepted the post.

He then wrote to his future wife, Annie Haggerty, that he knew there was "a great prejudice" against the idea of black soldiers. "At any rate, I shan't be frightened out of it by its unpopularity. I feel convinced I shall never regret having taken this step, as far as I myself am concerned, for while I was undecided I felt ashamed of myself, as if I were cowardly."

A Regiment is Born

For his number-two, Shaw selected Lt. Edward Needles Hallowell. Hallowell was also from the *2nd Massachusetts*, but had been born to a Philadelphia Quaker family. (Hallowell would later rise to lieutenant colonel and take command of the *54th.*) The rest of the regiment's original roster of 29 white officers averaged just 23 years old, yet most had already smelled the smoke of battle.

In the middle of February 1863, the cadre of the *54th* reported for duty at Camp Meigs, in Readville, on the outskirts of Boston. There the black enlistees soon became displeased when they learned they would march without a single black officer. Boston abolitionist minister Wendell Phillips, in a speech to the men about this situation, managed to smooth things somewhat by asking, "But if you cannot have a whole loaf, will you not take a slice?"

On 25 March, Shaw (now a colonel) wrote to his sponsor, Gov. Andrew, "The intelligence of the men is a great surprise to me. They learn all the details of guard duty and camp service infinitely more readily than most of the Irish I have had under my command. There is not the least doubt that we shall leave the State with as good a regiment that has [ever] marched."

At a review of the *54th* held in Boston on 16 May, before 1,000 spectators, the governor presented the regiment with four flags. He stood in the center of the troops and said, "My own personal honor, if I have any, is identified with yours. I stand or fall, as a man and magistrate, with the rise and fall in the history of the *54th Massachusetts Regiment.*"

The regiment soon received orders to report to Gen. David Hunter, commander of the Coastal Department of the South, in South Carolina. On 28 May, about 20,000 citizens turned out to cheer as the *54th* marched through the streets to the State House. From Beacon Hill, Shaw's mother watched her son, astride his charger, lead his command. "What have I done," she asked, "that God has been so good to me?"

"John Brown's Body" played as the marchers stepped down State Street, past the site of the Boston Massacre, where Crispus Attucks, a black man, had been killed by the British in 1770. The troops finished their march at Battery Wharf, then boarded a steamer to sail to their final destination.

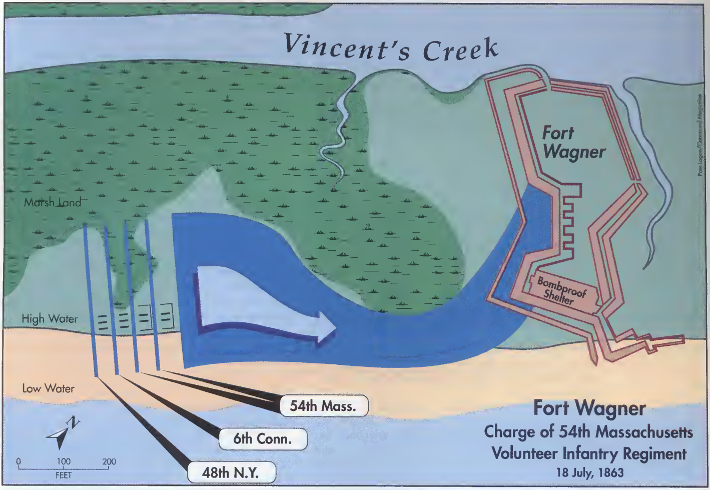
Earlier that month, the Confederate Congress had approved a new law. According to its provisions, any white officers commanding black troops were liable for "inciting servile insurrection," and such offenders, if captured, were to be "put to death."

Preliminary Operations

The regiment arrived at Hilton Head, South Carolina, on 3 June 1863. Once there, the entire *54th* was subordinated to Col. James Montgomery, commander of the US *2nd South Carolina Regiment*, which had been raised locally from black "contrabands."

Shaw became furious when Montgomery ordered the *54th* to assist in burning the town of Darien, Georgia. But even his protest to their overall commander, Gen. George C. Strong, didn't save the place . (Shaw's family would donate money to aid in the town's restoration after the war.)

These operations were all part of the Union's attempt to capture Charleston, where an attack the



Fort Wagner
Charge of 54th Massachusetts Volunteer Infantry Regiment
18 July, 1863

Pam Logan/Command Magazine

previous year by the navy had failed. The city and its harbor were a virtual fortress, with island forts and batteries ringing the entire perimeter, on James Island, Morris Island, Sullivan's Island and Fort Sumter. These already strong defenses had been considerably improved, after September 1862, when Gen. Pierre G.T. Beauregard (a trained engineer) took over command of the area for the South.

The new Union army department commander, Gen. Quincy Adams Gillmore (whose replacement of Gen. Hunter had been one result of the burning of Darien), resolved to make another try at Charleston — this time by way of Morris Island and Fort Wagner. Wagner and its defenses were commanded by the tough Confederate Gen. William B. Taliaferro, a veteran from Stonewall Jackson's corps in Virginia, and a 1,700-man garrison.

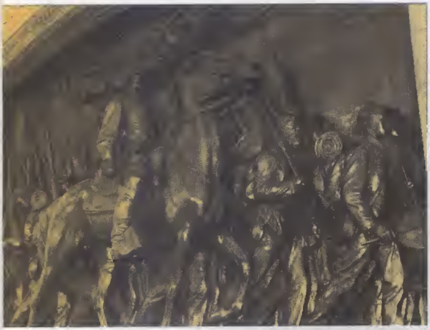
Gillmore moved onto the island on 10 July, taking almost all of it except for the fort itself, and losing 339 men in the process. Instead of immediately pushing on to take Wagner, he allowed his men to camp and rest. Everyone on both sides knew it was only a pause before the final assault.

During the morning of 18 July, the Yankees began their preparatory bombardment of the fort, and kept at it for 11 hours. The Rebels fired back until 4 p.m., when they halted their futile response. During the artillery duel, the Stars and Bars were twice shot from the fort's flagpole, and twice replaced. Only the relatively few Confederate artillerists were actually exposed to the Union guns — all the rest huddled safely inside the fort's bombproof.

Taliaferro later estimated as many as 9,000 shells rained into the fort. Most of the Confederate ordnance inside was eventually smashed or buried, but Rebel casualties were only 8 killed and 20 wounded.

At the end of the bombardment, the Union *1st Brigade* commander, Gen. Strong, summoned Shaw to his headquarters and said, "You may lead the column if you say yes. Your men, I know, are worn out, but do as you choose."

Shaw agreed immediately and told his number-two to get the men, who were then resting along the beach, ready to move. By 6 p.m., the regiment had reached the vicinity of Strong's headquarters, where the two officers sat dining. At 6:30, Shaw rose from the table to address his command a final time. (Shaw had expressed a premonition of his own death to Hallowell: "If I could live a few



The famous St. Gauden's statuary tableau.

weeks longer with my wife and be home a while I think I might die happy. But it cannot be. I do not believe I will live through our next fight.")

"I want you to prove yourselves," he said to his troops. "The eyes of thousands will look on what you do tonight."

Shaw then turned to Hallowell again and said, "I shall go in advance with the national flag. You will keep the state flag with you; it will give the men something to rally 'round. We shall take the fort or die there."

Gen. Strong told the men of the *54th* to forgo bullets and rely entirely on their bayonets. He then walked to the regiment's flagbearer and asked, "If this man should fall, who will lift the flag and carry it on?"

Shaw replied, as he pulled out and lit a cigar, "I will." Cheers erupted from the entire regiment.

It was 7:45 p.m. and almost dark. To the east, fog set in, while to the west, despite the sun's setting, the sky still retained brightness.

Shaw gave his final orders for the attack: "Move in quick time until within 100 yards of the fort, then double-quick and charge."

The Assault

Col. Shaw planned to advance against the fort with his regiment arrayed in two "wings," with five companies in each. (Sgt. Carney of C. Company marched in the first wing.) Because of the narrowness of the approach, the second wing had to line up behind the first — even then, those on the right moved through sea water.

Saber in hand, Shaw led his men forward. When they arrived 200 yards from the walls, the defenders began raking them with musket and cannon fire. The Rebel fire blew gaps in the *54th's* formation, but the attackers closed ranks and continued on course.

Sgt. Maj. Lewis Douglass would afterward write to his girlfriend about that phase of the attack: "Men fell around me. A shell would explode and clear a space of 20 feet; our men would close-up again, but it was no use to retreat, which was a very hazardous undertaking. How I got out of that fight alive I cannot tell, but I am here."

At 100 yards the pace was increased to the double-quick, and Shaw cried, "Forward, *54th!*" Soon they reached the moat, and instantly everyone was wet.

At the base of the wall, Capt. Cabot J. Russel, of Company H, a 19-year-old New Yorker, went down. Company K's commander, Capt. William H. Simkins, bending down to help, was also hit, and fell dead over Russel's body.

Sgt. Maj. Douglass, who had been one of the first to reach the wall, now exhorted his men. "Come on, boys," he yelled, "and fight for God and Gov. Andrew!"

As the first few men of the regiment reached the top of the wall, they immediately had to fight hand-to-hand. Rebel artillerists swung their rammers, while the Yankees used bayonets and fists. The defenders began tossing grenades down the walls at those still below.

Atop the parapet, Col. Shaw was killed by a shot in the heart. Other officers went down around him. Lt. Col. Hallowell was struck in the groin. Nine company commanders were wounded.

Sgt Carney saw the Stars and Stripes begin to fall from its bearer's dead hands just as both men had begun ascending the rampart. He grabbed the flag, and later recalled, "The ranks showed dreadful gaps made by the enemy's fire. In less than 20 minutes I found myself alone, struggling upon the ramparts, while all around me lay the dead and wounded piled one upon another."

As bullets and shrapnel continued to fly around him, Carney crouched low and tried to decide what to do. The firing suddenly shifted to his right, and he noticed a body of soldiers coming toward him. He at first thought they were friendly, but then just as quickly saw they weren't. Resolved, he wound the flag around its staff and began his descent back down the walls. He was the only Union man still standing in the area around him.

"Upon rising to determine my course to the rear," Carney later wrote, "I was struck by a bullet. But as I was not prostrated by the shot, I continued on my course. I had not gone very far, however, before I was struck by a second ball."

Then a third shot gored him. Blood flowed freely from his head and legs. He fell and bruised his chest badly. Finally, after he had gained some distance from the fort, a New Yorker from the *48th* guided him to safety and offered to carry the flag. Carney replied that he would give up the standard only when he returned to his regiment.

"Men cheered me and the flag," he wrote of his reunion with the survivors of the *54th*. "And my reply was, 'Boys, the old flag never touched the ground.'" In his after-action report, Lt. Col. Hallowell cited Sgt. Carney for bravery.

Inside the fort, Rebel counterattacks soon overpowered the few pockets of men from the *54th* who were still fighting, before any other blue units could join them. The *6th Connecticut* and *48th New York* gained a portion of the southeastern bastion, where they were assisted by some men from the *7th New Hampshire* and others from the two Ohio regiments in the second wave.

But there were never enough Union men to secure a lodgement. The Southerners had brought up the *32nd Georgia Regiment* as a reinforcement, and then the men of the *100th New York* blundered and accidently volleyed into the backs of the few Northerners who were inside. The Union reserve, the *3rd Brigade*, started out, but by then all those in the first two brigades who were still alive and uncaptured had evacuated the ramparts. All shooting stopped by midnight.

Capt. Luis F. Emilio was the ranking officer still on his feet. He regrouped the survivors as best he could outside the fort, and awaited the Rebel sortie he expected at any moment. But the Confederates were content to remain inside their defensive works. At 2 a.m., the *10th Connecticut* relieved the *54th* in line, and the black men moved to the rear.

Epilogue

The *54th* suffered 34 killed, 120 wounded and 100 missing during the assault. In total, the Northern assault force lost 1,515 casualties, or about 25 percent of the entire force committed. Both Union brigade commanders were killed, nine of the ten regimental commanders were killed or wounded, and the overall assault commander, Gen. Truman Seymour, died that night. The Rebels lost a total of only 174.

Of the 100 men missing from the *54th*, 40 turned out to have been killed, and the rest were captured. Two of those black soldiers were later tried in a southern court, but the able defense work of Charleston attorney Nelson Mitchell saved their lives.

The Confederates buried Shaw and his men without ceremony or identification in a mass grave. A Confederate officer present reportedly said (though he later denied it): "We buried him with his niggers." Shaw's father later declined to have his son's body recovered; he felt he would have preferred to stay there undisturbed.

Sgt. Carney's wounds brought him a medical discharge from the army within a year, but he survived to march with the other veterans of the *54th* on 30 May 1897. On that date Augustus St. Gauden's bronze memorial to the regiment was unveiled opposite the State House in Boston — 34 years after the unit had paraded before it on its way south.

Carl Cruz, the great-great-great maternal nephew of Sgt. Carney, and a resident of Massachusetts, proudly displays his ancestor's photo and Medal of Honor.

Carney's bravery was officially — if tardily — recognized when he was awarded the Congressional Medal of Honor in 1900. He was the first black man to receive the award — his nation's highest military honor. He died in December 1908.

Fort Wagner wasn't brought back into the Union until 7 September 1863, when it was discovered the Rebels had opted to evacuate on their own. (Charleston itself hung on until 17 February 1865.) The *54th*, still on the island, was given the honor of entering the bastion first. The *54th* went on to fight in other campaigns, in South Carolina and Florida, but none outdid the horror of Fort Wagner.

Lewis Douglass wrote home to his sweetheart, "My dear girl, I hope to see you [again, but] I must bid you farewell should I be killed. Remember if I die, I die in a good cause. I wish we had a hundred-thousand colored troops; we would put an end to this war."

Most importantly, the valor of the *54th* boosted black recruitment throughout the nation. By 1865, a total of 186,000 black men had fought in the Union Army and Navy — thus exceeding Douglass' wish.

Sgt. Carney summarized it all when he said after Fort Wagner "there was no longer a question as to the valor of northern negroes." ✪

AirLand Operations

The US Army's Search for a New Doctrine

by Bo Eldridge

"An army's fundamental doctrine is the condensed expression of its approach to fighting campaigns, major operations, battles and engagements. Tactics, techniques, procedures, organizations, support structure, equipment and training must all derive from it. It must be rooted in time-tested theories and principles, yet forward looking and adaptable to changing technologies, threats and missions."

Army Field Manual 100-5, *Operations*

Doctrine

Doctrine is the blueprint for how an army intends to fight. It is unique to each nation, based on the overlaying values of its society, its military traditions, the quality of its soldiers and leaders, the sophistication of its warfighting technology, the terrain on which it plans to do battle, and the military demographics of the potential foes it is most likely to face.

A nation that ignores one or more of those inputs in the development of its doctrine will produce an unexecutable wartime strategy. In 1941, for example, the Soviets had superior numbers and better equipment than the Germans, yet they nearly lost the war in the first six months of the campaign. Despite having had nearly two years to study the new German doctrine and techniques of *Blitzkrieg*, they failed to make adequate doctrinal adjustments. Their officers and men thus proved incapable of coping with the tempo of the ensuing invasion.

Democratic societies tend to formulate doctrine emphasizing the initiative of the individual soldier, while totalitarian states (which often have less well-educated populations) tend to stress dogmatic conformity and adherence to orders. A mass conscript army will develop a more straightforward, head-to-head, style of warfare than a smaller professional army, whose canons will feature greater boldness and risk taking. Doctrines based on the "Science of War" will be more centralized and restrictive; those rooted in the "Art of War" will be more decentralized and flexible.

Tenets governing the operations of a technologically advanced army will emphasize mobility and maneuver, while a less modern force may be compelled to employ positional defensive tactics and set-piece offensive operations.

Fundamentals designed for employment in a desert will vary from those shaped for use in mountainous terrain.

A nation accustomed to air superiority will craft a doctrine quite different from another expecting to cede control of the air early in a campaign.

Finally, winners are more inclined to improve and refine the doctrine that proved successful in their most recent war, while losers tend to start writing their new doctrine on an entirely clean sheet of paper.

On an otherwise even playing field, the superiority of one army's doctrine over that of another can make a profound difference, as was the case with the German *Blitzkrieg* in 1939-41. There are other such precedents throughout history: the Macedonian phalanx, the Roman legion, the Spanish *tercio*, Gustavus Adolphus' introduction of the combined arms concept during the 30 Years War, and the combination of Prussian discipline, drill, and the oblique order under Frederick the Great a century later.

When superior doctrine is directed against an enemy lacking an equal level of training, morale, leadership and equipment, the results can be spectacularly one-sided. That was the case with the Italians in 1940, the Arabs in 1967, the Argentinians in 1982, and the Iraqis in 1991.

"Doctrine establishes a particular way of thinking about war and a way of fighting."

— Fleet Marine Force Manual 1, *Warfighting*

Doctrines Change

Trying to apply a doctrine developed for one kind of war to a different combat environment, against an enemy not playing by the same doctrinal rules can end in disaster. America discovered that in Vietnam, and the Soviets rediscovered it in Afghanistan.

Opposing doctrines that are not modified to match technological change can also result in mutual carnage, as both North and South learned in the American Civil War when they applied Jomini's Napoleonic-era offensive dictums against massed rifle volleys. Similarly, it took years of unprecedented slaughter before the Germans came up with infiltration tactics in an effort to break the deadlock on World War I's Western front.

At the other end of the learning curve, the Israelis were able to modify their doctrine in the midst of a short war in October 1973, employing a balanced combined arms operation to cross the Suez Canal into Africa. That was only two weeks after their "doctrinally correct" mounted tank charge against the Egyptian bridgehead was shattered by salvos of Saggers and RPG-7s.

The doctrinal situation in the 1991 Gulf War stands in contrast to all those examples. There the US Army's doctrine, called "AirLand Battle," though it was developed for the topographically compartmented battlefields of Europe, still prevailed in a completely one-sided manner in the open deserts of southern Iraq and Kuwait.

It succeeded, in part, because in every conceivable category by which the combat effectiveness of a nation's armed forces is measured, the Iraqis came in a distant second to the US. AirLand Battle was designed to provide victory under less than optimal conditions. In Iraq, conditions were ideal; solid doctrine and planning, combined with total air superiority, ample logistical stocks, and the time necessary to assemble, acclimate and train the forces in preparation for the war, brought victory. It is unlikely, though, all those factors will come into such perfect alignment again any time soon.

After such an overwhelming victory, the temptation to not tinker with success is great, and would be in keeping with historical precedent. However, the follow-on doctrine to AirLand Battle was already in development years prior to 1991. At first it was called "AirLand Battle-Future," back when it was still focused on a Soviet threat to Europe. Now it has been adjusted to meet the strategic demands of the New World Order, and is being fine-tuned to incorporate the massive volumes of lessons-learned from Desert Storm. This new doctrine is now termed "AirLand Operations."

AirLand Operations

Much has changed in the ten years since the first version of AirLand Battle (ALB) Doctrine was published in 1982. AirLand Operations (ALO) captures those changes in a transition from a doctrine designed to be employed in Europe against a Soviet Union that no longer exists, to one capable of being used in any part of the world, against an enemy yet undeclared.

ALB was a revolutionary operational concept, replacing the conventional Active Defense Doctrine that preceded it. ALO refines and integrates those same ALB principles and fundamentals into an overarching umbrella concept. While seeming to be only evolutionary on paper, in reality, ALO in its application will have a revolutionary impact. It introduces a level of violence and an unrelenting pace of war that only a professional armed force with matching sophistication in doctrine, technology, structure and quality of individual soldiers and leaders can hope to sustain.

ALB was tactically oriented. ALO has an operational slant — one echelon higher. It makes the corps or Joint Task Force (JTF) commander a real warfighter, instead of a resource allocator. It is at that level battle becomes less of a single-service brawl, and more of a coordinated effort between air, ground, and naval forces. ALO is thus a "joint" (service) doctrine. (ALB was, at best, a bilateral concept shared by the Army and Air Force.) ALO is applicable to all four services, and was drawn up that way in recognition of the fact they will all play vital and complementary roles in the next war, just as they did in the Gulf.

ALB was Eurocentric, concerned with reinforcement of established forward-deployed forces. ALO is directed toward regional conflicts, based on power projection and contingency operations conducted by US-based forces. That is significant because it places a greater premium on getting those forces there quickly, by sea and air. It is a more complex arrangement than simply reinforcing NATO, because the new situation forces American units to take their entire logistics infrastructure with them and establish it at the same time combat elements are being rushed into position. In Europe, everything was already there waiting for them.

ALB introduced the concept of the "nonlinear battlefield" — a fluid fighting ground with large gaps between units and without fixed boundaries — as a deviation from the norm. ALO accepts and embraces that same idea as a balanced companion to linear operations. Nonlinear operations focus on the enemy and his destruction — instead of on seizing or defending terrain — by applying the "four Fs" (Find'em, Fix'em, Fight'em, Finish'em).

The new doctrine requires accurate and timely intelligence, the means to quickly disseminate it, and the forces trained and equipped to conduct free-wheeling maneuver warfare. It sidesteps head-to-head confrontations, attacking the enemy on his flanks and rear within an offensively oriented framework. At the same time, it recognizes it may be necessary to fight a linear defensive battle of attrition in one sector to create the conditions and free forces for nonlinear operations in another.

ALB was based on weapons systems then entering the inventory, in order to take advantage of their exponentially increased capabilities. Desert Storm was fought with those systems. ALO is future-based, defining the technologies required in order to fully implement the doctrine, and it provides the means to incorporate those new technologies as they come on line. That is the way it is supposed to be — doctrine driving requirements.

ALO's "Operational Cycle"

In order to overlay a sense of organization and timeliness to simultaneous and ongoing events, ALO has divided the operational cycle of battle into four sequential stages, and carved the zone of operations into six overlapping areas.

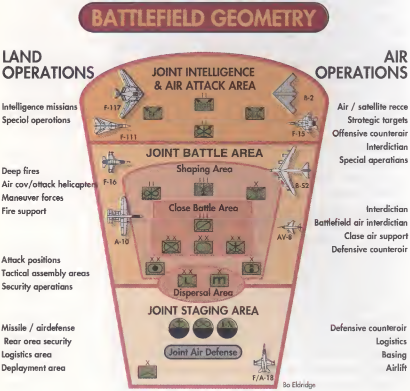
Stage I: Detection/Preparation. The first step is getting the forces there, and then protecting them while the hectic deployment continues. It should be noted that every deployment may not be into a friendly port or airfield, as was the case in Saudi Arabia. A "forced entry" may be required, calling on the Marines and the *82nd Airborne* to establish beach- and airheads, before additional ground and air forces can be brought into the theater.

Assuming the deployment is allowed to proceed into the rear staging area prior to the initiation of hostilities, the next requisite is to prevent surprise. Space-based satellites watch for any signs of a pending enemy offensive, while airborne AWACS and JSTARS aircraft keep closer tabs on their air and ground sectors of responsibility in the intelligence and air attack area. As units marry up with their equipment and move forward to the dispersal area, a combined arms force (consisting of air and ground cavalry, augmented by artillery and other combat support) provides a forward protective screen.

The screening force also conducts operations against the enemy's recon forces, preventing them from gaining any information about our activities. In the air, combat air patrols provide the same kind of screening function. At the same time, Special Operating Forces (SOF) are inserted deep into the intelligence area to confirm electronic reports and conduct on-the-ground surveys of potential targets.

While all that is occurring, headquarters staffs are feverishly planning and updating, never sure when and if the shooting will start; always ready to fight the war with the forces immediately at hand if it begins unexpectedly.

Stage II: Establishing Conditions for Decisive Operations. The war has begun. The first order of business for the sea- and ground-based air forces is to gain air superiority over the air attack area, and to maintain air supremacy over the battle area, protecting friendly ground forces from enemy air attack. Simultaneously, enemy ground units are subjected to continual air attack as they transit the two zones and begin entering the shaping area.



Bo Eldridge

Army and Marine "deep fires" assets (attack helicopters, ATACMS, MLRS and TSSAMs) are then employed in concert with tactical aircraft to strike, separate, isolate and wear down enemy forces. Their goal is to make it difficult for the enemy to mass, upset their timetables, sow confusion, break down command and control, and set them up for the next stage of operations. It is at the conclusion of this phase the "initiative" must pass from the enemy to the friendly commander, who must then boldly launch his counterstrike. Timing is critical.

Stage III: Decisive Operations. After the needed conditions have been established, the issue is decided in the close battle area. Previously dispersed forces are brought rapidly together to achieve the necessary mass and combat power to overwhelm the enemy in selected zones, gaining freedom of maneuver for follow-on operations in a fast-paced, cascading series of events. The enemy is never given time to regain his balance, adjust his plan, or react in an effective manner to friendly actions.

By being subjected to relentless and simultaneous attacks in depth by air and artillery, his follow-on echelons are prevented from effectively linking up and deploying with their forward elements.

During this phase, the commander who can sort out the chaos and maintain command and control of his forces has the deciding edge over his opponent. At some point, through defeat of the enemy, exhaustion of his immediate reserves, or by operational decision, Stage III is brought to a close.

Stage IV: Reconstitution. It is necessary to quickly reconstitute the force before continuing operations following the close battle. The first action will be to re-disperse and re-establish security forward. Sustaining operations (rearm, refuel, recover, repair, and replace) are conducted. Units are reorganized to fill the holes created by combat losses. If those losses are severe enough, units are pulled back and "regenerated" by infusion of replacement personnel and equipment. The objective is to recover from the close battle quickly, and be prepared to resume combat operations in as short a time as possible. The cycle then repeats itself from Stages II-IV, as many times as necessary until victory is achieved.

Weapons Technology & Acquisition

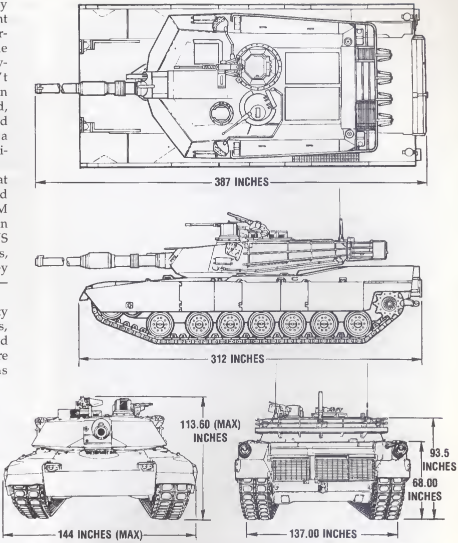
Many new systems and modifications to existing weapons are presently in the acquisition pipeline, or at varying stages of research, development and testing. All are essential in varying degrees to the successful execution of ALO doctrine on future battlefields. Not all will smoothly run the gauntlet of internal Army and Department of Defense (DoD) budget reviews, nor will all survive the passage across Capitol Hill. With the accelerating decline in the defense budget following our Cold War victory, there simply isn't enough money to fix all the things that are broken or need improvement. Programs will be slipped, stretched and sundered; many will be terminated for budgetary reasons. For example, at $4 million a pop, upgrading the tanks in a single armored division would cost over $1 billion.

The US cannot afford, however, to play a pat hand while the other players around the world continue to draw new cards. While Iraqi T-72M tanks were clearly outmatched by American M1A1s in 1991, a battle fought by those same US tanks in 1999 against Japanese-supplied Type-90s, or British-built Challenger IIs — and manned by more competent and motivated enemy crews — might result in an outcome not to our liking.

In order to provide maximum future flexibility against an unknown range of potential threats, within a severely constrained Peace Dividend Budget, the DoD is proposing a radical departure from the long-established process of weapons acquisition. That is, it simply won't *acquire* them. Instead, it will develop technology, build prototypes, test them, improve them, and then put the blueprints in storage, to be brought out occasionally when a new bell or whistle comes out of the labs and is ready to be installed and evaluated.

Thus, new pieces of hardware will not be put into production until required, based on priority, affordability, clear superiority over the system it replaces, and changes in the worldwide threat equation. At the same time, production of current systems (Abrams, Apaches, MLRS, etc.) will be curtailed.

This concept assumes members of Congress will agree to shut down job-sustaining production lines in their home districts. It also assumes the defense industry — which historically used R&D as a "loss leader" for follow-on assembly line production — can continue to maintain America's military technological edge even though the profit charts may start dipping into negative territory.



M1A2 ABRAMS . . .MAIN BATTLE TANK

Armor

The planned follow-on to the Abrams M1A1 tank is the M1A2. The most striking improvement to the "A-deuce" is the Commander's Independent Thermal Viewer (CITV), which will enable the tank commander (TC) and gunner to work as a "hunter-killer" team. The TC will find a target by its infrared heat signature and hand it off to the gunner by pressing a button, which will bring the gun and sights automatically onto his target. The gunner will engage it using his own thermal sights, while the TC searches for the next target. (Currently, the TC and gunner are limited to one set of shared optics.)

Another M1A2 innovation is the core "vetronics" system. (*Ve*hicle elec*tronics* are to tanks what "avionics" are to aircraft.) Instead of separate, hard-wired components, all controls are linked through two electronic buses. Vetronics will also feed data to the improved Commander's Weapons Station (CWS), which will display an electronic map, all tanks in the command net, and the location of known enemy positions. It will also show the current fuel and ammo status of all other tanks in the network on request. In addition, it will provide the TC with his own tank's position to within a couple of meters. This is made possible by an internal Position Navigation (POSNAV) system, employing an inertial gyroscope.

The Army, however, is having a hard time finding the necessary funding to build the M1A2. For two consecutive years, Congress provided "seed money," but they have not come up with the money to foot the rest of the bill. A solution may be to employ a mix of M1A2s and improved M1A1s. Only the commanders would get the M1A2 with the CWS, while the remainder of the tanks would be upgraded M1A1s, fitted with POSNAV and CITV.

The successor to the Abrams series, the Future Main Battle Tank (FMBT), will provide an even greater electronics capability through use of second generation vetronics. To be fielded early in the 21st century, the FMBT will be up-gunned from the current 120mm smoothbore to a 140mm gun, fed by an autoloader system that will cut the crew size from four to three. Its weight will be reduced from the M1A1's 68 tons down to the 50-ton range.

Piercing Armor

by Chris Perello

The two primary types of projectiles currently used to defeat armored vehicles are kinetic energy projectiles and high explosive rounds.

Kinetic projectiles (so called because they rely on kinetic energy: *force = mass x velocity)* are solid penetrators fired at very high speed. If the power of the projectile at the point of impact is sufficient to overcome the armor at that point, the result is a hole. Once inside the tank, the projectile bounces around, wrecking what it hits. Secondary damage is caused by spalling, metal splinters created whenever the round hits anything (including the interior skin of the tank's armor). A second lethal projectile may also be created out of the armor from the hole: the sheer speed of the impact melts the armor into a slug, which will also bounce around the tank.

To increase the force available at the point of impact, the projectile must be fired faster, or must use a denser material. Increasing the size of the projectile will not necessarily work, because, though a larger projectile means greater mass, it will be spread out over a greater area of impact. Longer projectiles, which concentrate greater mass on the same surface area, are dependent on the ability of the material forming the projectiles to resist crumpling on impact (which dissipates the energy). The current material of choice for the projectiles is depleted uranium, the densest material available.

High explosive rounds derive pentrating power not from the speed of flight, but from the explosion of the onboard charge. By shaping the nose of the shell, the explosion is directing into a very hot, very fast plasma jet, which exerts tremendous pressure on the point of impact. As with the kinetic round, if this pressure is sufficient, a hole is punched thorugh the armor. Once inside, the gas and the molten armor melt or burn the tank's contents.

The great advantage of high explosive rounds it they do not require a powerful (and therefore heavy) gun. This means light vehicles and individual soldiers can carry effective anti-armor weapons. However, high explosive shells can be defeated by a variety of armor schemes, all of which try to diffuse or deflect some or all of the plasma jet before it contacts the main armor. Among the methods used are spaced armor (a thin layer set some distance outside the main layer), cellular (which uses many small cells to disperse the jet), layered or laminate armor (which sheds layers to absorb the blast), and reactive armor (which explodes in the opposite direction of the incoming plasma, sort of like using a fire to put out a fire).

The FMBT's protection level will be greatly increased over that of the Abrams by using a mix of passive, active and reactive measures. "Passive" protection will be provided by an upgraded mix of steel, ceramics, depleted uranium and lightweight composite armors. "Reactive" armors detonate on impact, throwing up an armor plate and breaking the plasma jet of shaped charge warheads. A new automated "active" armor system will knock an enemy missile of course before it has a chance to strike.

Survivability can be further enhanced by a host of add-ons also being considered. They include "signature" suppression (magnetic, acoustic, visual, seismic, infrared and ultraviolet), jammers (optical, millimeter wave, and radio frequency), automatic chaff dispensers, false target generators, and a new family of vehicle-launched smoke and visual obscurants. Survivability is more than just living to fight another day; it increases a force's lethality by generating a more favorable "loss-exchange ratio."

On the light-armor side, there is a need to replace the Vietnam-era M551A2 Sheridan assault vehicle in the *82nd Airborne Division*. The solution is the M4 Armored Gun System (AGS), intended to provide an armored punch to the Contingency Corps' rapidly deployed light forces, prior to the seaborne arrival of the follow-on heavy forces.

The tracked AGS will mount a low-recoil 105mm gun with a thermal sighting system. One battalion of 58 AGSs will be configured for low velocity air drop and be dedicated to the *82nd*. Two other battalions will be air transportable, capable of being airlifted in anything from the C-130 to the C-17. They will be assigned to the *XVIII Airborne Corps* for immediate reinforcement of an airhead, once secured by the paratroops. The new *2nd Light Cavalry Regiment* will also receive the AGS. If the number of systems to be procured is expanded beyond the presently ordered 300, the light infantry divisions could each also end up with an AGS battalion.

Anti-Armor

The Line-of-Sight Antitank (LOSAT) system is designed to replace the old M901 Improved TOW Vehicle (ITV) assigned to the mechanized infantry battalion's anti-tank company. It will fire a new Kinetic Energy Missile (KEM), which will be guided to the target at a speed of around 5,000 feet per second. The 9-foot long KEM has no explosive charge, relying on the mass and velocity of its depleted uranium or tungsten-alloy long-rod penetrator to literally punch through both sides of the enemy tanks.

The only way to defend against LOSAT for now is to avoid being hit. It will overmatch all current and projected future armored vehicles for the next couple of decades. The LOSAT will be built on a stretched M2 Bradley chassis, necessitated by the length of the missile, which will normally be carried inside the track, "under armor," and be raised hydraulically to be fired.

The replacement for the M47 Dragon missile in the dismounted infantry squad is the "Javelin" Anti-Armor Weapon System-Medium (AAWS-M). It requires a team of two men, weighs about 45 lbs., and has a maximum range of 2,000 meters (about double that of the Dragon and in a class with the Milan II).

As a "fire and forget" missile, it needs no guidance once it achieves lock-on. This is a great improvement over the disappointing Dragon, which required the gunner to calmly guide the missile all the way to the target — a difficult feat when breathing heavily after a sprint backpacking the missile and launcher, or while "distracted" by incoming artillery fire. A thermal sight will provide the Javelin with full day-night capability.

Light infantry battalions will receive 18 missile launchers, while mechanized infantry battalions will be authorized a total of 36.

For targets outside the normal engagement range, the Non-Line-of-Sight (NLOS) missile provides a 10,000-meter stand off capability. It comes in two versions: anti-tank (AT) and air defense (AD).

NLOS is a top-attack weapon, overmatching the thinner armor on the top surface of tanks and other armored vehicles, while NLOS-AD carries a high explosive round for its anti-helicopter role. Both are guided by fiber optic cable, spooled out as the gunner watches a TV screen, literally "flying" the missile out to the engagement area and selecting his target on arrival. Hills and ridgelines offer no protection from a weapon that can hunt from the air.

Infantry Fighting Vehicles (IFV)

The M2 Bradley IFV was proven in combat during Desert Storm. There are a number of possible improvements to the latest M2A2 version, including an upgraded transmission and better armor, and possibly the inclusion of a laser rangefinder, as is found on all US tanks. The present 25mm cannon, which was able to penetrate the side armor of Iraqi T-55 tanks, may also be switched for a gun in the 35mm range, while earlier versions of the Bradley may be modified to accept the newer TOW II anti-tank guided missile. There is also the possibility the M1A2s vetronics system may be retrofitted into a select number of Bradleys, to allow them to electronically interface with the tankers in combined arms teams.

The Bradley will eventually be replaced in frontline units by the Future Infantry Fighting Vehicle (FIFV), built on the same basic heavy chassis as the FMBT. This will enable it to be as mobile as the tank during cross-country maneuver, while providing the onboard infantry squad with tank-like protection far beyond that provided by the Bradley. Like the M2 series, the FIFV will feature a tandem gun/missile capability, with the gun used against light to medium armored targets, and the missile employed primarily against enemy tanks.

Cavalry Fighting Vehicles (CFV)

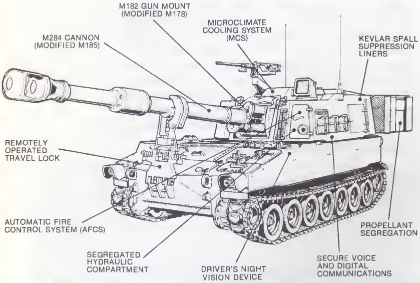
Division and regimental cavalry squadrons currently use the M3 Bradley CFV as their scout vehicle. It is virtually identical to the M2 IFV, except some of the interior space is used for storing additional TOWs, since the dismounted scout squad is much smaller than its infantry counterpart. As a fighting vehicle it is superb; as a reconnaissance platform it is less than satisfactory. It is too big, too tall, and too noisy.

As an interim measure, and perhaps to prod the cavalrymen to do less fighting and more snooping, the scouts organic to the tank and mechanized infantry battalions are switching their CFVs for wheeled HMMWV "Hummers" of Desert Storm fame. For the long term, a requirement for a Future Scout Vehicle (FSV) is being drawn up. It would be an advanced composite armored vehicle, incorporating "low observable technology" (the Army version of "Stealth") with reduced radar, thermal and visual signatures.

Tube Artillery

Much was written prior to Desert Storm about the inadequacy of our "Redlegs" *vis a vis* Saddam's artillery arm. In the near term, the upgrade to the M109A6 Paladin will boost the self-propelled 155mm howitzer's range by one-third, while great-

ARMORED GUN SYSTEM


M182 GUN MOUNT (MODIFIED M178)
MICROCLIMATE COOLING SYSTEM (MCS)
M284 CANNON (MODIFIED M185)
KEVLAR SPALL SUPPRESSION LINERS
REMOTELY OPERATED TRAVEL LOCK
AUTOMATIC FIRE CONTROL SYSTEM (AFCS)
PROPELLANT SEGREGATION
SEGREGATED HYDRAULIC COMPARTMENT
DRIVER'S NIGHT VISION DEVICE
SECURE VOICE AND DIGITAL COMMUNICATIONS

M109A6 PALADIN

ly decreasing its vulnerability by using semiautonomous "shoot and scoot" tactics.

Instead of firing from platoon or battery positions, painting a counterbattery radar trail back to the firing unit and inviting a counterfire response, the Paladin will be able to fire independently from single-gun positions. This will be made possible by incorporation of onboard GPS. With it, position-location data are transmitted back to Fire Direction Control computers, which then conduct the firing calculations for each gun and feed that information to the individual artillery pieces. The Paladin can then move immediately to its next firing position, or simply continue moving until another call-for-fire is received.

The same type of system will be applied to the Paladin's successor, the Advanced Field Artillery System-Cannon (AFAS-C). It will be built on the same high-speed chassis as its ammunition carrier, the Future Armored Resupply Vehicle-Artillery (FARV-A), reducing production costs and easing the logistical burden by creating a commonality of spare parts. It will also erase the "mobility differential" that caused a number of synchronization problems during Desert Storm, when the slower M109 howitzers were unable to keep up with the faster Abrams and Bradleys.

MULTIPLE LAUNCH ROCKET SYSTEM

However, while the FMBT and FIFV incorporate armor suites optimized for protection against direct fire weapons, the AFAS-C armor envelope will emphasize defense against enemy top-attack weapons used for the counterbattery mission. It will feature an autoloader, greatly increasing the volume of fire. Additionally, the FARV-A will be able to back up to it and rapidly replenish its ammunition supply (again, with an automated system).

The most revolutionary aspect of the AFAS-C, however, will be its gun. It will utilize a "liquid propellant" (LP) system instead of the familiar powder bags or the traditional pelletized explosive used in one-piece casings. The propellant is sprayed into the combustion chamber and then ignited, expelling the projectile out of the gun tube at a high muzzle velocity. With LP, the range of the 155mm can be boosted to 29 kilometers for standard rounds, and up to 50 kilometers when firing rocket-assisted projectiles. The propellant itself, which can best be described as high-tech liquid fertilizer, is an "insensitive munition," meaning that if the LP reservoir is hit, it won't blow up.

Deep Fire

One of the reasons the Army has been willing to discard its artillery- and missile-launched nuclear weapons is because the new family of precision deep fires systems are actually more effective against targets than the old nukes, and without the problems of fallout and collateral damage. The performance of the Multiple Launch Rocket System (MLRS) during Desert Storm was, in fact, awesome. A battalion of 27 launchers was able to put a punishing ripple-fire volley of 324 rockets, carrying roughly 200,000 grenade-like submunitions, into the air in less than a minute.

The only drawback to MLRS was its lack of hard-target kill capability. With new Sense and Destroy Armor (SADARM) submunitions, that shortcoming will be corrected. Released above the target area, SADARMs seek out their prey with millimeter-wave and infrared sensors, while parachuting toward the earth, driving an explosively formed penetrator into the top armor of the target.

SADARM was developed primarily as a counterbattery munition, to be fired against stationary enemy artillery positions. Those positions were located by radar tracking of enemy rounds, calculating the position from the trajectory of the shells.

SADARM rounds would be fired off while the enemy rounds *were still in the air*.

One draw back, however, is that the MLRS is a tracked weapon, built on a stretched Bradley chassis, and must therefore deploy by sea. In order to provide an air transportable system capable of rapid deployment, a wheeled version, called the High Mobility Artillery Rocket System (HIMARS), is also being considered. The number of 6-foot launch pod containers would be decreased from two to one, but HIMARS would still be able to provide long range fires and serve as a powerful counterbattery weapon for the light forces.

Both wheeled and tracked systems will be able to reach farther into the enemy rear areas with the Extended Range MLRS, which will boost the missile out to a distance of 46 kilometers (a 44 percent range increase), by lengthening the rocket motor and reducing the warhead size.

For targets in excess of 100 kilometers away, the Army Tactical Missile System (ATCMS) is the weapon of choice. It takes only 10-15 minutes to reconfigure an MLRS launcher for ATACMS, by removing the two 6-shot pods and installing a pair of single-shot containers. During Desert Storm, ATACMS suffered from the same soft-target limitation as the MLRS; the 950 antipersonnel submunitions carried in each warhead were ineffective against heavily-armored vehicles. New smart anti-armor submunitions are now being developed, along with an upgraded ATACMS missile, the Block II, with a greater range.

Also in advanced development is the Tri-Service Standoff Attack Missile (TSSAM), capable of being drop-launched from Air Force and Navy planes, and soft-launched from Army MLRS systems. TSSAM is a former "black program," only recently unveiled. It is a low-observable cruise missile with a still-classified range of between 100-600 kilometers. Unlike ATACMS, which can be picked up by air defense radars while in flight, the terrain-hugging TSSAM would strike with virtually no warning.

The Army payload being developed for it is the Brilliant Anti-Tank (BAT) submunition (also a previously black program). It employs both acoustic and infrared sensors, and has a tandem shaped-charge warhead to defeat reactive armors. Unlike SADARM, BAT is designed to engage large moving targets, such as a column of advancing tanks, by first using its acoustic sensor to home in on the noise generated by their treads and engines, and then switching to the IR seeker to zero-in on an individual target.

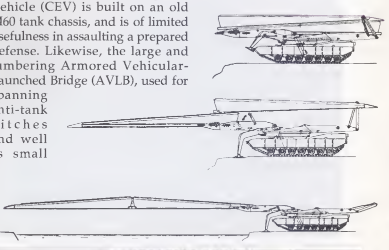
A millimeter-wave sensor may also be added to BAT allowing it to engage stationary targets. Work is also going on to enable the ATACMS to carry BATS, but the technicians have to figure out how to disperse the submunitions at Mach 2.2 (that's three times faster than the TSSAM) at the release point. ATACMS would carry 13 BATs, while the number carried by each TSSAM is still classified.

ARMY TACTICAL MISSILE SYSTEM

Engineers

Desert Storm highlighted some weaknesses in the Army's countermine and obstacle-breaching capabilities, despite the speed with which our forces were able to penetrate the Saddam Line. Pre-attack drills and rehearsals were conducted up to the day of the attack, and many *ad hoc* and bolt-on solutions contributed to the successful outcome.

The present Combat Engineer Vehicle (CEV) is built on an old M60 tank chassis, and is of limited usefulness in assaulting a prepared defense. Likewise, the large and lumbering Armored Vehicular-Launched Bridge (AVLB), used for spanning anti-tank ditches and well as small



HEAVY ASSAULT BRIDGE

rivers, is too slow and too vulnerable for the pace of ALO. The proposed interim solutions are the M1 Breacher and the Heavy Assault Bridge (HAB), both using the faster, better-protected M1 tank chassis. For the long term, the Combat Mobility Vehicle (CMV) will be fielded on the heavy FMBT chassis, incorporating a variable-depth mine plow, an excavating arm, and other engineering tools.

Air Defense

It was the improved PAC-2 version of the Patriot missile, hurriedly shipped to Saudi Arabia and Israel, that earned the title of "Scudbuster" during Desert Storm. The new PAC-3 will be able to intercept targets at an altitude more than 50 percent higher, increasing the protected ground area by a factor of eight. An expanded multi-mode seeker, with both active and semi-active radars, will further improve accuracy. A new lightweight version, able to be transported by C-141 Starlifters, is also being developed.

A lot of criticism has recently appeared about the performance of the Patriot during the Gulf War, much of it unsubstantiated hyperbole. In truth, the Patriot did not do as well as initially thought, but neither did it perform as poorly as some critics have subsequently alleged. The truth lies in between the two extremes. The PAC-2 was not designed for tactical missile defense (TMD) against small targets traveling at Mach 2, but was intended for use against larger and slower aircraft. That it did as well as it did when pressed into TMD duty is remarkable.

AH-64 APACHE

When assessing the conflicting claims and accusations launched down range by the pro and con antagonists, it is sometimes useful to read between the lines and search for their hidden agendas. The TMD success of Patriot gave SDI a big boost at a crucial time in that program's development. Tens of billions of SDI dollars are at stake and, win or lose, its future is now intertwined with the outcome of the Patriot debate.

However, while the Patriot is well suited to cover the rear areas of the battlefield, there are serious shortcomings in the forward zones. The demise of the ill-fated Sergeant York system left the multi-barreled 20mm Vulcan in the inventory far longer than had been planned. During Desert Storm, newer Avenger systems, consisting of Stinger missiles pedestal-mounted on an HMMWV, were pressed into service to supplement the obsolete Vulcans.

For the future, the Army had pinned its hopes on the Air Defense Antitank System (ADATS). Carrying eight laser "beamrider" missiles on a modified Bradley chassis, along with integrated identification and tracking radars, the ADATS was intended to provide protection against both helicopter and jet attack aircraft. Given a series of serious reliability problems exposed during early operational tests, it appeared the air defense community had sired a "Son of York." Combined with the lack of any real air defense requirement during the 43 days of Desert Storm, and the fact ADATS was too heavy to deploy by air, the program was terminated by the DoD in January 1992.

In practice, that decision gave the forward air defense mission to the Air Force. Given the increasing sophistication and proliferation of attack helicopters, and the inability of a high speed fighter to find a low-flying helicopter in ground clutter (proven by numerous tests and exercises), the Army is concerned.

Hawk and Chaparral missile systems are based on 30-year-old technology, and are intended for defense of fixed sites against medium altitude threats. The Stinger is devastating when the target's heat signature is highlighted against an open sky, but is far less capable against a hovering attack helicopter blended into a terrain background.

As an interim fix, the Stinger's seeker could be upgraded, and for better protection it could be placed on a Bradley. The Army could also buy the Marine Corps' LAV-AD, currently in development on a Light Armored Vehicle (LAV) chassis. However, for the long term, no answer has yet been found.

Attack Helicopters

Armed with a 30mm automatic cannon and carrying up to 16 Hellfire missiles, capable of traversing the battlefield day or night at high speed, no matter the terrain and weather, the AH-64 Apache was another of the weapons systems that defied critics and performed magnificently in the southern Iraqi desert. With the addition of Longbow millimeter wave radar, coupled with a new fire-and-forget Hellfire missile, the AH-64D will have greater capabilities.

Longbow is mounted in a squashed dome on top of the Apache's rotor head, and consists of a Fire Control Radar (FCR) that detects both ground and air targets, and a Radio Frequency Interferometer (RFI) that identifies active emitters. The system's computer classifies the targets, establishes priorities for engagement, and passes information to the Hellfires' seekers. If the pilot or copilot chooses to perform a visual engagement, he can still turn to his Target Acquisition Designation Sight and Pilot Night Vision Sensor (TADS/PNVS), whose Forward Looking Infrared (FLIR) sighting system can clearly pick out a target's heat signature against the noontime desert sand or during a foggy moonless night.

Scout helicopters designate the targets for attack helicopters, and are also given the mission of finding the enemy for the ground forces. The current scout helicopter, the OH-58 Kiowa, is a day-only, fair-weather aircraft with limited range and speed. As a result, Apache attack battalions were forced to conduct armed aerial reconnaissance without their scouts during much of Desert Storm, a mission for which the aircraft and unit were not designed. The new RAH-66 Commanche will correct those deficiencies. It will not only replace the aging OH-58s, but also the variants of the venerable AH-1 Cobra gunship found in air cavalry and light attack helicopter units.

The Commanche is a low-observable, highly maneuverable, all-weather, state-of-the-art, fly-by-wire aircraft. For recon missions, it will be equipped with a 20mm multi-barrel cannon and six Hellfire missiles, stored in an internal weapons bay (*á la Airwolf*). For attack missions, bolt-on wings can be quickly attached to bring the Hellfire load up to 14 missiles. When required, the Longbow radar dome can be rapidly affixed to the mast head, giving it an enhanced targeting capability to complement its new second-generation FLIR sighting system.

Like the Apache, it is capable of self-deployment up to a range of about 1,200 miles, using wing-mounted external fuel pods. More importantly, when getting there quickly and with maximum combat power is paramount, four Commanches can be carried inside an Air Force C-17 transport and be flying missions 22 minutes after touchdown.

The Commanche was scheduled for fielding beginning in 1997, but in early 1992 that goal was changed to an unspecified date. That means the OH-58D Kiowa Warrior will be flying on point for a longer time than planned. Currently in the eighth year of limited production, the Warrior was to serve as an interim scout aircraft pending the arrival of the Commanche. Its unique mast-mounted sight, resembling a large basketball with sunglasses, houses a thermal imaging system, low-light television, and laser rangefinder/designator. The former gives it an all-weather targeting capability, while the latter allows the Warrior to provide the necessary laser "paint" on the target, while the Apache launches its Hellfires from behind.

The Warrior is also capable of carrying Hellfires itself, serving in the armed recon or light attack role. In fact, it was the armed OH-58D, assigned to the Army's Task Force 160, that worked with other Special Operating Forces against the Iraqi-held oil platforms and small offshore islands during the Gulf War. Prior to that, they flew missions off US Navy ships against Iranian gunboats during the "Reflagging Exercise."

Command, Control, Communications and Intelligence (C^{3}I)

ALBM, SAST, MBMR, CSSCS, FAADC2, MCS, ADDS, SICPS, ASAS, AFATDS, SINCGARS, MSE, MILSATCOM, CSCE, DTA, CCMS, JSTARS, GBCS, UAV, ATCCS, etc.

The C^{3}I arena is a bewildering kaleidoscope of undecipherable acronyms describing facets of the magical art of moving streams of electrons through the air between two or more receiver/transmitter stations. It also encompasses the sensors, computers and other black boxes that transform megabytes of raw data into manageable, timely, usable information. In the broad realm of military technology, this is the one field where the US has a clear and unmistakable lead over the rest of the world. Similarly, of all the mission areas contributing to the success of ALO, C^{3}I is undeniably the most critical. Without it, ALO simply will not work.

Exotica

There are many hi-tech programs being energetically pursued in the labs and on the secret test ranges, many of them offshoots of the SDI (Star Wars) effort. One of them is the Electric Gun program. In it, three technological approaches are being followed. All are aimed at producing a quantum boost in muzzle velocity, resulting in an exponential increase in megajoules (a measurement of kinetic energy) at point of impact.

The electromagnetic (EM) railgun uses massive electrical surges and magnetic fields to expel the projectile. EM coilguns use sequentially pulsed conducting coils to accelerate the projectile out of the barrel. Electrothermal-chemical (ET-C) guns use electric energy in concert with a chemical "working fluid" in a conventional gun tube with an unconventional breech.

While there are many potential applications for EM or ET-C, primarily for tanks but also for smaller caliber cannons and air defense applications, the common denominator for all three research and development endeavors is electricity — lots of electricity. Before they can be "weaponized," scientists must figure out a way to get the power supply (enough for the energy needs of a small city during its nanosecond pulse) into a package smaller than a moving van. It will take a couple of decades before we are ready to slap an EM or ET-C system on a tank.

Another concept still requiring a great deal of additional research is the Composite Armored Vehicle (CAV), which uses lightweight, space-age, materials in concert with a Buck Rogers suite of active and reactive armors to provide protection. A CAV chassis could also provide a means to move away from the bulky, slab-sided armored vehicles of today, and use "low observable" technologies to make it a much tougher target to acquire. The eventual goal is a tank in the 30+ ton range that could be carried by Air Force transports. Before reaching that objective, a smaller-scale application with a lower protection requirement (such as the FSV) is a more likely outcome.

"Directed Energy" weapons are much closer to arriving. One type was sent to the Persian Gulf for "realistic operational testing." The Stingray is a low-energy laser system mounted on an M2 or M3 Bradley, supplementing its standard cannon, missile and machinegun armament. It is used to disable enemy electro-optical sighting devices with a burst of laser energy. The gunner scans his front, selecting and engaging targets for neutralization, while the system automatically scans and suppresses other targets posing an immediate threat to the Stingray-equipped vehicle, using laser return pulse reflections to determine which enemy optics are pointed at it. The Stingray concept engenders a certain degree of controversy. If an enemy gunner happens to be looking through his sights at the same time the laser hits it, his eyeballs receive the same treatment as his optics.

A parallel development effort that also received a test during the war is the High-Power Microwave (HPM). Most of the Navy's 100+ Tomahawk missiles launched at the beginning of Desert Storm carried a standard 1,000 lb. explosive warhead. Some of them, though, carried spools of gossamer-like carbon fibers, released to float down to the ground and short circuit Baghdad's electrical power grid. Now it also appears a few of them carried a special HPM payload, designed to cripple the electronics suites of the Iraqi air defense network.

Working much like the electro-magnetic pulse of an atmospheric nuclear detonation, but on a much smaller scale, the HPM warhead uses an explosive charge to create a burst of searing radio energy that burns out unshielded electronic components within range of its wave. Of course, such a device tends to be a one-time, omnidirectional, indiscriminate weapon, frying the circuit boards of friend and foe alike. The Pentagon, however, has been working on other approaches in the highly classified "black world." The goal is to be able to focus the energy from a mobile, renewable, source packing upward of a gigawatt jolt. Such a weapon could not only be used to knock aircraft out of the skies and shock a tank's fire control system into inoperability; it could also be used against close-in helicopters.

Structure

In 1991 we fought a short, intense war that still ended up involving nearly half of our conventional land, sea and air power. Some time over the next two decades, we will probably fight again. When we do, our combat forces will be drawn from a much smaller pool of divisions, groups and wings.

The military was already beginning its draw down in 1990, when Saddam Hussein's Republican Guards swept into Kuwait City. One brigade of the *2nd Armored Division* at Fort Hood had already cased its colors, and another, the Tiger Brigade, was about to begin its equipment turn-in when it was alerted to move to the Texas port of Beaumont for deployment to Saudi Arabia.

Getting to the Base Force by '95

	1990	1995	% Cut
Army Active Divs	18	12	33%
Army Reserve Divs	10	6	40%
Marine Divisions	3	2+	22%
Aircraft Carriers	15	12	20%
Carrier Air Wings	13	11	15%
Ships	545	450	17%
Tac Fighter Wings	24	15	38%
Strategic Bombers	268	188	30%

For the next year, all unit deactivations were put on hold until the DoD unveiled its new "Base Force" — the master plan for the drastic reduction of the nation's armed forces — to be achieved by 1995. While the raw numbers of units will decline, those remaining will also undergo change, as new capabilities and concepts are introduced.

The most significant organizational changes in support of ALO are in the Air Force, with the formation of the new "Composite Air Wings." In essence, these new units apply land warfare's combined arms concepts to the air war, putting fighter,

fighter-bomber, air reconnaissance, air defense suppression, and aerial refueling units under the same commander in peace and war. This will replace the current system of maintaining "pure" single-mission organizations in peacetime, and then task-organizing by mission in wartime.

The Army is also considering a number of less dramatic changes to its Tables of Organization and Equipment (TO&E) to be phased in over a number of years. Some changes have already been made, while others are still in the conceptual stage, with final decisions on them still forthcoming. As Active Army strength goes down by nearly a quarter of a million soldiers, some tough choices will have to be made.

There is unanimous consensus we will not return to the "hollow Army" of the 1970s, which resulted from a post-Vietnam demobilization that attempted to keep too many division flags flying when there was insufficient manpower and budget money to support them. The current "round out" policy, which reduced many divisions from three brigades to two, with the missing unit to be provided by the National Guard in time of war, was an outgrowth of that period.

The new realities mean any addition to division, brigade, battalion, company or platoon organization will have to be offset by a corresponding reduction elsewhere within the force structure. At the same time, the total number of active duty divisions will be cut from the 18 that existed before Desert Storm down to 12.

The *2nd Armored Division* has already completed its deactivation, with only its Tiger Brigade retained and transferred to the *1st Cavalry Division*. The *6th* and *10th Light Divisions* will be downsized to brigades or eliminated altogether. The *9th Mechanized Division* has been restructured as the *199th Motorized Brigade*. The European-based *8th Mechanized* and *3rd Armored Divisions* were drawn down and zeroed out last January, with the latter expected to replace the *5th Mechanized* in the US at a later date.

Further cutbacks in Europe or the Pacific could decrease the total number of division flags even more. With a smaller, leaner Army, the force design must de-emphasize the previous philosophy of "going the distance" in a long war, and instead focus on scoring a knockout in the first

DOWNSIZING THE REGULARS: FROM 1990 TO 1995

Divisions and Major Maneuver Brigades

1990	LOCATION	1995	COMMENT
1 XX	Germany	1 XX	Reconstituted in 92 fram former 3rd Armor and 8th Mech Div units
1 XX	Ft Hood, TX	1 XX	Na langer a raundaut div; 2nd Armar's "Tiger Bde" assigned os 3rd Bde in 91
1 XX	Ft Riley, KS	1 XX	Farward brigade in Germany deactivated in 91; canverted ta roundaut div
2 XX	Ft Haad, TX	2 XX	Placed in semi-active status until recanstituted in 93 as a raundaut div
2 XX	Karea	2 XX	Unique active campanent structure af 2 tank, 2 mech, and 2 light inf bns
3 XX	Germany	■	Deactivated in 92.; cauld be reactivated at Haad in lieu af 2nd Arm Div.
3 XX	Germany	3 XX	Recanstituted in 91 from mix af own and 1st Armared Div units
4 XX	Ft Carsan, CO	4 XX	Last ane active campanent brigade; canverted ta raundaut divisian in 90
5 XX	Ft Palk, LA	■	Moved ta Haad ond restructured/redesignated os 2nd Arm Div in 93
6 XX L	Ft Richardsan, AK	6 X L	Deactivated and restructured as o separate brigade by 95
7 XX L	Ft Ord, CA	7 XX L	Maved from Ft Ord to Ft Lewis
8 XX	Germany	■	Deactivated in 92
9 XX	Ft Lewis, WA	■	Deactivated in 91; tempararily restructured as 199th Matorized Bde
10 XX ▲	Ft Drum, NY	■	Deactivated by 95.
24 XX	Ft Stewart, GA	24 XX	Na langer a raundaut div; 197th Mech Bde assigned os 3rd Bde in 91
25 XX L	Schofield Bks, HI	25 XX L	Na change
82 XX	Ft Bragg, NC	82 XX	Na change
101 XX	Ft Compbell, KY	101 XX	Na change
2 III	Germony	2 III	199th Mtz Bde reflagged/canverted to 2nd LCR in 92; moved ta Palk in 93
3 III	Ft Bliss, TX	3 III	Na chonge
11 III	Germany	11 III	Na change
75 III RGR	Ft Stewart, GA	75 III RGR	No change
193 X L	Panama	193 X L	Future uncertain after pullaut fram Panama
194 X	Ft Knax, KY	194 X	One active duty battalion TF; remoinder provided by Natianal Guord
197 X	Ft Benning, GA	■	Assigned ta 24th Mech Div in 91 as its permanent 3rd brigade

XX 🟧 **"Roundout" units with an assigned mix of Active and Reserve Component units**

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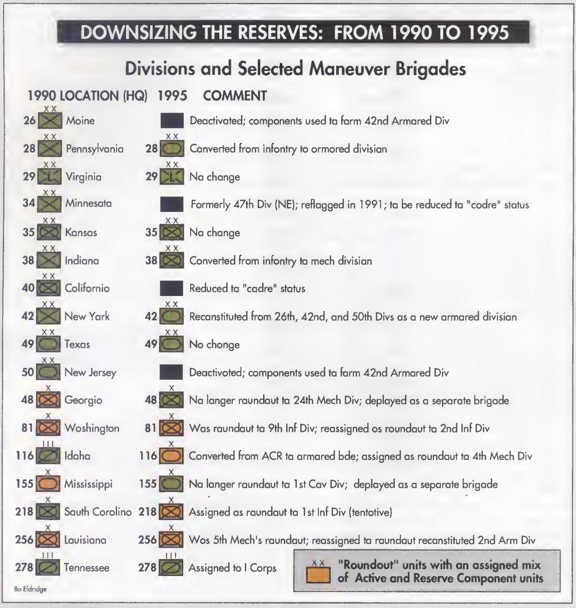
Minutemen and Militia

As part of the Reagan defense buildup during the 1980s, the Army National Guard and Reserves ("Reserve Components," or RC) grew from fewer than 600,000 to a peak strength of 776,000, nearly 50 percent of the Army's total manpower. In March 1992, the Department of Defense announcement this force would be cut to 567,000 by 1997 was met by an immediate storm of protest in Congress. The main issue was not national security — it was votes. That is, 1992 is an election year, the nation is in recession, and each company-sized 150-man armory represents an annual $2 million boost to its local economy.

From a military perspective, the reductions make sense. The Army's Active Component (AC) is being reduced from its 1980s strength of 781,000, down to 536,000, and the RC cuts are proportional. Eighty percent of the reductions come from RC units earmarked to reinforce AC units in Europe that have already been taken off the rolls. For example, the 100,000-man *VII Corps* in Germany is gone; it makes no sense to retain the 140,000 reservists who were supposed to reinforce it in time of war. With the dissolution of the Soviet Union, there is simply no mission for them. The other 20 percent of the cuts also come from RC units that have specific missions related to a Cold War no longer being waged.

The Reserves will still play a major role in any future conflict, just as they did in Desert Storm. With well over half its combat service support assets in the RC, the Army would be unable to respond to a major contingency without another call-up. It is the structure



DOWNSIZING THE RESERVES: FROM 1990 TO 1995

Divisions and Selected Maneuver Brigades

1990	LOCATION (HQ)	1995	COMMENT
26 XX	Maine	■	Deactivated; components used to form 42nd Armored Div
28 XX	Pennsylvania	28 XX	Converted from infantry to armored division
29 XX	Virginia	29 XX	No change
34 XX	Minnesota	■	Formerly 47th Div (NE); reflagged in 1991; to be reduced to "cadre" status
35 XX	Kansas	35 XX	No change
38 XX	Indiana	38 XX	Converted from infantry to mech division
40 XX	California	■	Reduced to "cadre" status
42 XX	New York	42 XX	Reconstituted from 26th, 42nd, and 50th Divs as a new armored division
49 XX	Texas	49 XX	No change
50 XX	New Jersey	■	Deactivated; components used to form 42nd Armored Div
48 X 🟧	Georgia	48 X	No longer roundout to 24th Mech Div; deployed as a separate brigade
81 X 🟧	Washington	81 X 🟧	Was roundout to 9th Inf Div; reassigned as roundout to 2nd Inf Div
116 III	Idaho	116 X 🟧	Converted from ACR to armored bde; assigned as roundout to 4th Mech Div
155 X 🟧	Mississippi	155 X	No longer roundout to 1st Cav Div; deployed as a separate brigade
218 X	South Carolina	218 X 🟧	Assigned as roundout to 1st Inf Div (tentative)
256 X 🟧	Louisiana	256 X 🟧	Was 5th Mech's roundout; reassigned to roundout reconstituted 2nd Arm Div
278 III	Tennessee	278 III	Assigned to I Corps

XX 🟧 "Roundout" units with an assigned mix of Active and Reserve Component units

Bo Eldridge

and missions of the RC's combat units that are being altered.

The Army is required to be able to put three light divisions on the ground anywhere in the world within 30 days, followed by two heavy divisions no more than 45 days later. Those five divisions — the *82nd Airborne, 101st Air Assault, 7th Light, 24th Mechanized,* and *1st Cavalry* — form the "Contingency Corps." The Gulf War validated the assumption it would take at least 90 days of concentrated training to bring a "round out" National Guard brigade up to a minimum level of combat readiness — too late to allow them to be deployed with the contingency forces, but soon enough to ship out with the "Early Reinforcing Corps," which consists of the *1st, 4th* and *5th Mechanized Divisions.*

This has a direct impact on the National Guard's "roundout" brigades. Under that concept, one-third of a division's combat assets are in an RC brigade that trains with the division throughout the year. When mobilized, the brigade is supposed to join its parent for a final training period before deploying to the active theater of operations. Roundout brigades are still assigned to the Early Reinforcing Corps, but not the Contingency Corps. The *1st Cavalry* and *24th Mechanized* have been restructured as "pure" AC divisions, and their former roundout brigades — the *155th Armored* and *48th Mechanized* — have been reclassified as "roundup" units. They will remain affiliated with their old divisions, but if deployed, will do so as separate brigades in a reinforcing corps.

The number of RC divisions is being reduced from 10 to 6, plus two "cadre" divisions maintained at only skeleton strength (see table). Some are being deactivated, and others are being reformed from selected remnants of earlier units.

The six remaining RC divisions form the basis for the "Follow-On Reinforcing Corps." It takes at least one full year to bring such outfits up to a deployable readiness level, and around two years for the cadre divisions. Given that, none would be available for any contingency scenario, but would instead by mobilized to reconstitute the strategic reserve if the other US-based divisions shipped out.

With the exception of the *29th Division,* which will remain light infantry, the others will be converted to either armored or mechanized organizations, a process that could take several years itself. (The "straight leg" infantry division will soon join the horse cavalry as a military anachronism on the modern battlefield.)

The Army 1990 vs 1995

	1990	1995
Forward Presence		
Pacific/Korea	3 Divisions	2 Divisions
Western Europe	2 Corps 4+ Divisions	1 Corps 2 Divisions
Contingency	1 Corps 5 Divisions	1 Corps 5 Divisions
Early Reinforcing	1 Corps 6 Divisions	1 Corps 3 Divisions
Follow-on Reinforcing	1 Corps 10 Divisions	1 Corps 6 Divisions
Total Divisions	**18 Active** **10 Reserve**	**12 Active** **6 Reserve***

*excludes the 2 Reserve cadre divisions

round of a short one. Every proposed TO&E change must pass the acid tests of increased lethality, survivability, mobility, sustainability and deployability.

> *"America's new Army will be smaller, but it will maintain the effectiveness edge we have today on our enemies. Smaller and equally effective — capable of decisive victory. That is a tall order."*
>
> — Gen. Gordon R. Sullivan, USA

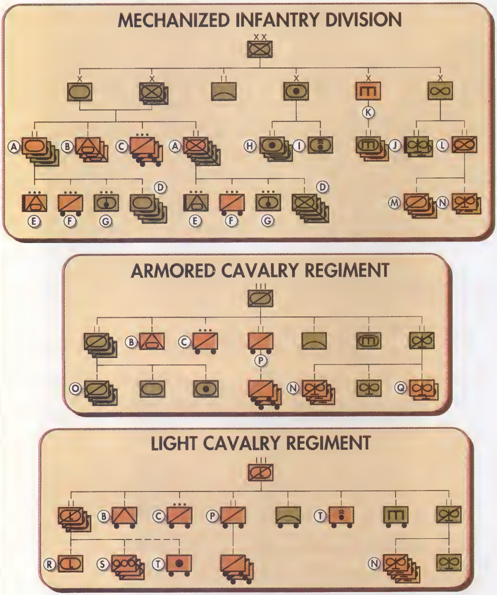
The Heavy Divisions. "Light" divisions include airborne, air assault, and light infantry. Most of their programmed changes are equipment-based, rather than structural. However, for the "heavy" tank and mechanized infantry divisions, there are a number of alterations being considered.

A. The current heavy divisions are built around 10 tank and mechanized infantry maneuver battalions. This number will be reduced to nine to offset manpower increases elsewhere, bringing the number of maneuver battalions back to where it was a decade ago. A 5x4 tank-mech battalion mix will replace the present 6x4 ratio in armored divisions, and a 4x5 breakout, instead of today's 5x5, in mech divisions.

In most cases, this will result in "triangular" 2x1 tank, and 1x2 mech, brigades. One exception is the *1st Mechanized Division,* which will be organized with two active duty tank-heavy brigades and one National Guard mech brigade.

B. A new long-range antitank company will be organic to each maneuver brigade headquarters, comprised of 12 track-mounted NLOS systems. An NLOS troop will also be added to the regimental cavalry headquarters, but will be mounted on wheeled vehicles. They will work directly for the regimental or brigade commander, or be placed under the operational control of a squadron or bat-

AIRLAND BATTLE OPERATIONS
Organizational Changes Under Consideration



🟧 = new or significantly restructured units

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talion task force, depending on the mission, enemy and terrain.

C. The original "Division 86" TO&E included a reconnaissance & security platoon in the brigade headquarters, but that was deemed unaffordable in terms of the additional personnel spaces and the funds needed for another 180 Bradley CFVs. Desert Storm again highlighted the need, and the idea is being re-examined, along with the notion of putting the same capability in the regimental cavalry headquarters. Cutting out the tenth maneuver battalion has freed some spaces, and putting the platoon in wheeled "Humvees" slashes the dollar cost.

In addition to providing a limited reconnaissance and screening capability, scout "runners" may be the only means to pass orders and sort out the chaos when communications nets are jammed or contact is lost, just as they were in the Napoleonic era.

D. An armored battalion used to have three tank companies of 17 tanks each, a combat support company with a hodge-podge of dissimilar platoons, and a headquarters company. When the M1 was fielded, the number of line companies was increased from three to four, while the number of tanks in each was cut from 17 to 14. The combat support company was absorbed into a new, larger headquarters company. The mechanized infantry battalions have four infantry companies, each fielding 13 infantry fighting vehicles (IFV), a headquarters company, and an anti-tank company.

The Army is looking at the tradeoffs involved in decreasing the number of line companies from four to three. This would reduce the number of tanks in an armored battalion from 58 to 44, and the IFVs in a mechanized battalion from 53 to 40.

Of all the potential changes, this appears to be the least likely in the near term. Any increase in command and control or deployability is more than offset by the loss of combat power, tactical flexibility and "robustness" (the ability to suffer significant combat losses and still remain a combat-effective unit).

E. The anti-tank company of the mechanized battalion will replace its old ITV Hammerheads with LOSATs, while a new LOSAT anti-tank platoon will be placed in the tank battalion. The LOSAT company will provide the mechanized battalion with long range, overwatching fires. The tank battalion's platoon would in part make up for the loss of the fourth tank company. (If the tanks are retained, the LOSAT platoon will probably not be added.)

Delays in fielding LOSAT have caused a minor controversy over the fate of the mechanized battalion's "Echo (E) Company." When the ITV was first introduced, the mechanized infantry's "fighting vehicle" was the M113 armored personnel carrier (APC). They were slow, thinly-armored, and mounted only a .50 caliber machinegun. Now that every Bradley has a TOW launcher, the ITV is somewhat superfluous. However, to disband the Echo Company now, as advocated by some, runs the risk of not having the spaces or experienced anti-tank soldiers available when the LOSAT hits the units around the end of the decade. An interim solution might be to give M3 CFVs, with their larger missile stowage capacity, to selected AT companies, at least in the Contingency Corps.

F. In the 1970s, there were 10 M113 APCs in the maneuver battalion's scout platoon, armed with a mix of Dragons and pedestal-mounted TOW ATGMs. These were replaced in the current TO&E with six M3 CFVs. While increasing the platoon's firepower, the loss of 40 percent of its vehicles cut into its robustness and overall mission capability. Six vehicles were simply not enough to cover the nonlinear battlefield's extended front and flanks. Armed with more firepower than a World War II tank, the scouts were also inclined to do more fighting than scouting, and subsequent losses would worsen the numbers equation.

To solve both problems, the six CFVs are presently being replaced by 10 wheeled HMMWVs. Down the road, they will be switched for FSVs (still on the drawing board).

G. The six 4.2 inch (106mm) heavy mortars in the maneuver battalions will be replaced with four new 120mm mortars on tracked carriers. The 120mm is a more capable weapon, but the loss of two tubes, plus one of the two Fire Direction Centers (FDCs), means the platoon will no longer be able to provide fire and smoke support with one section stationary while the other is moving.

The mortars are the only artillery the battalion task force commander knows he can get whenever he needs; this reduced flexibility has caused some concern.

H. US artillery battalions are moving in the opposite direction. For decades they were organized into three batteries of six guns each (which is still the model for most armies). Tactical employment was by firing battery, linked to the battalion's FDC by radio and, distance permitting, by wire. In the mid-1980s, the Army began reshaping its self-propelled units into 8-gun batteries, allowing separate employment of 4-gun platoons. This increased their responsiveness in support of ALB's fast-paced maneuver operations, allowing a battery to move by platoon, while retaining half of its firepower in position to answer calls-for-fire. It also decreased its vulnerability to counterfire, with twice as many potential firing positions for the enemy artillery to acquire, target and engage.

While the towed battalions will retain their 18-gun configuration, the SP units will soon complete their conversion to the 24-gun structure.

I. When the old 8-inch (203mm) self-propelled howitzer battalion was retired from the divisions, an MLRS battery of nine M270 tracked rocket launchers (227mm) was inserted instead. This considerably increased both the range and volume of "steel on target" available to the division for general support fire missions, even though the number of systems had been reduced by half.

Studies are underway to find out if the MLRS assets would be better employed if pulled from the division and concentrated in battalions held at corps level. That would be in keeping with the philosophy of giving the corps commander the means to conduct the "Deep Battle," while division commanders fight the "Close Battle." However, the divisions are understandably reluctant to give up any of their firepower to "higher headquarters." A compromise solution being floated is the idea of reducing the MLRS battalions from 27 launchers to 18, thus freeing enough of them to retain a smaller battery in the division.

J. Along the same lines, in an effort to give the corps commander greater control over his deep attack assets, the Apache-equipped heavy attack helicopter battalions will be taken out of the division and placed at corps. They will be organized in regimental groups of three battalions each, totaling 54 AH-64s and 39 OH-58s (to be reduced to 45/30 once the more capable Commanche replaces the Kiowa).

Both the MLRS and Apache issues have strong adherents on both sides of the argument. To the division commander, the Apache battalion is his "ace in the hole" — able to readily exploit a fleeting offensive opportunity or plug up an unexpected hole in the defense until a ground maneuver unit can get to the scene. To the corps commander, the Apache regiment represents an awesome all-weather, high-speed capability to mass a potent anti-armor punch in the attack or defense.

The wild card could turn out to be the Air Force's effort to put all deep attack assets — attack helicopters, ATACMS, and Army TSSAMs — under the operational control of the Air Component Commander for the integrated prosecution of the air phase of the campaign. It's one thing to discuss who — the two-star or the three-star general — has control of internal Army assets. But when the issue is "green suit" versus "blue suit" control, the ensuing arguments give new meanings to the term "AirLand Battle."

K. In order to support self-contained brigade-level operations on a nonlinear battlefield, the division's engineer contingent will be expanded from a single battalion to a full brigade. This will give each of the division's three maneuver brigades a full engineer battalion in direct support, able to conduct six separate "in stride" breaching operations simultaneously.

Engineer brigades are routinely attached to divisions from corps, but normally come equipped with dump trucks and bulldozers. Such equipment is useful for building obstacle belts and keeping supply routes open, but is of marginal value in direct support of maneuver units.

There has also been a change in the mission of the expanded engineer organization. When the Army was preparing for a war in Europe, the focus was on "mine warfare" — the building of fighting positions, anti-tank ditches, and minefields. With the strategic swing to contingency operations, and the increasingly offensive tone of tactical and operational doctrine, the emphasis has shifted from "mine" to "countermine" — or mobility instead of countermobility.

The assault on the Saddam Line during Desert Storm revealed a number of critical deficiencies in this area. The new units and equipment should provide a much-needed maneuver warfighting capability.

L. When the number of maneuver battalions was originally boosted from nine to 10, one of the "bill payers" was the divisional cavalry squadron. It lost all its tanks, along with one of its three ground cavalry troops. Even before Desert Storm, there was a growing consensus that two ground troops, totaling 36 CFVs, were not enough to cover the division's front and open flanks, particularly at night, or during periods of reduced visibility when the air cavalry's Cobras and Kiowas were rendered half blind or grounded.

It was also recognized that tanks are needed to enable cavalry to fight for information and perform traditional, independent economy-of-force operations. The "school solution" of attaching tanks to the cavalry from one of the armor battalions on an as-needed basis proved unsatisfactory in practice, due to the high degree of training and mutual support required between scouts and tankers sent on complex reconnaissance and security missions. Under current plans, the squadron will be brought back to three ground troops, enabling one to be in support of each maneuver brigade during nonlinear operations. It will also get back its tanks.

M. Each ground troop will be comprised of three mixed platoons, consisting of both tanks and CFVs, plus a section of three 120mm mortars. There was a lot of discussion about whether the CFVs and M1A1s should be organized into separate platoons, in line with the cavalry regiment's organization, or whether the platoons should be mixed. The latter approach has won the most votes, though the debate continues.

Since cavalry platoons are rarely employed "pure," usually going out in mixed sections, the mixing makes tactical sense. The real question, though, is the number of combat vehicles in the new divisional platoon. Two tank-CFV mixes were considered: a 3x5 and a 2x3. While the 3x5 was preferred, the 2x3 was more affordable, and will be implemented beginning in 1993. However, the door will remain open for a subsequent transition to a 3x5, or even back to a pure configuration, at a later date.

N. The air cavalry troop, organic to several types of cavalry organizations in both light and heavy divisions and regiments, consists of six OH-58 scout aircraft and four AH-1 Cobra attack helicopters. There are fewer helicopters in the squadron's two air cavalry troops than in a single air troop in the old TO&E, but with a pair of troops, the squadron is also able to conduct two simultaneous air missions, a capability that was difficult to execute with only a single outfit. When the RAH-66 is fielded, both present aircraft types will be replaced by eight Commanches, giving the troop a full, 24-hour, all-weather capability with a single aircraft type able to perform both recon and light attack roles.

Armored Cavalry Regiment (ACR). Employed on the basis of one per heavy corps, the ACR doctrinally operates forward of the divisions, shaping the offensive or defensive battle until the divisions enter the fray. Then it normally reverts to a flank or rear security mission, though it may be given its own sector on the line or be reconstituted as a reserve force.

During Desert Storm, the two US corps (*XVIII* and *VII*) used their regiments differently. Given the depth and breadth of the *XVIII Corps'* sector in the west, coupled with the fact the French *6th Light (Division Daguet)* covering the flank was in essence a large light cavalry division, the *3rd ACR* was attached to the *24th Mechanized Division* and functioned in many respects as a fourth maneuver brigade. In the center, the *2nd ACR* was assigned a more traditional cavalry mission, screening to the front of *VII Corps* during its advance. (The fact *VII Corps'* commander, Lt. Gen. Franks, was an ex-cavalry regiment leader, may have had something to do with that.)

In addition to the structural changes already discussed, the modifications described below are also being considered.

O. The current regimental armored cavalry troop is composed of two scout platoons, each with six CFVs, and two tank platoons of four M1A1s each, along with a heavy mortar section of two tubes (one normally attached to each scout platoon) and an additional tank and CFV in the troop headquarters.

There are no plans to integrate scouts and tankers in the regimental cavalry platoon, as is being planned for the divisional cavalry. The rationale is that the operational demands on the two types of cavalry squadrons are different, and that the present TO&E is already optimized for the regiment's broader range of missions in support of the corps. That doesn't mean, though, the issue of pure versus mixed will not resurface in the future.

P. A new ground recon squadron will be created to perform highly mobile, stealthy reconnaissance for the corps in the area between the forward elements of the armored cavalry squadrons and deeper Long Range Surveillance Units (LRSU). It will be equipped with 20 wheeled HMMWVs in each of its three troops until the low-observable FSV is eventually fielded. An identical squadron will be assigned to the new light cavalry regiments.

Typically, a corps has a better picture of the enemy force that is still 12 hours away than it does of the bad guys it is about to blunder into during the next couple of hours. That's because of the lag time in getting information acquired, downloaded and disseminated from the hi-tech airborne and space-based intelligence-gathering systems. The wheeled recon squadron will put human eyeballs into that traditional intelligence vacuum for time-critical reports of last-minute changes in enemy dispositions and activities. It also prevents surprise attacks.

Q. The regimental aviation (or air recon) squadron is an organization unique to the armored cavalry, having both attack helicopter and air cavalry under the same headquarters. The two attack troops will replace their seven AH-1S and four OH-58s with eight RAH-66s, configured with wing-mounted weapons in the light attack helicopter (LAH) mode. As presently envisioned, three of the eight will also be fitted with the Longbow radar system, for rapid target acquisition and battle handoff. The LAH battalions assigned to the airborne, air assault, and light infantry divisions will be configured with three Commanche companies each, organized in the same manner as the attack troops.

Light Cavalry Regiment (LCR). The ACR, with its tanks, Bradleys, and self-propelled artillery, must deploy by sea. There is thus a need for an air-transportable cavalry regiment to operate in support of the Contingency Corps or a Joint Task Force, conducting security operations during the critical and vulnerable deployment and build up phases.

Many designs for an LCR are being considered, with the leading candidate shown in the diagram. It is basically a lighter-weight image of the ACR. The *199th Motorized Brigade*, currently at Fort Lewis, Washington, is being redesignated as the *2nd LCR*. (The *2nd ACR*, which fought the Battle of 73 Easting during Desert Storm, is being taken off the books as part of the NATO draw down. Once it transfers its regimental colors to Fort Lewis, it will redeploy to Fort Polk, Louisiana, where it will displace the *5th Mechanized Division*. The regiment's air troop will be the *4-17 Air Cavalry*, currently stationed at Fort Bragg, North Carolina, and assigned to *XVIII Corps*.)

R. The light armor troop, organic to the new light armored cavalry squadron, will consist of 14 Armored Gun Systems (AGS). The AGS is not a light tank, a label that has been erroneously applied to its predecessor, the M551 Assault Vehicle, for the past 25 years.

Its tactical employment would be more closely aligned with the German *Sturmgeschutz* (assault gun) battalions of World War II. It would fight tanks when it had to, and would be capable of defeating them, but that would not be its primary mission. In the LCR, it would serve in the same roles as the tank company in the ACR squadron, backing up the cavalry troops and providing concentrated muscle when called on to do so.

S. The three company-sized troops in each light cavalry squadron will consist of four platoons organized along "pure" ACR lines: two scout platoons with six HMMWVs each, and two AGS platoons, each with four weapons systems. HMMWV-TOWs will be used as an interim replacement until the AGS is fielded, with the remaining "Hummers" eventually replaced by FSVs.

Besides conducting their own offensive intelligence-gathering missions, the cavalry will be required to strip away enemy recon forces, disrupt synchronization of the enemy main effort, and provide combat power in support of divisional operations. While that combat power is less than that provided by the Abrams and Bradleys of the ACR, the LCR troops will be on the ground in theater while their ACR counterparts are still at sea.

T. The LCR will have only one HIMARS battery of nine launchers in support of the regiment. With its extended range, three HIMARS platoons could cover the regiment's extended front with firepower equivalent to the ACR's 24 155mm SP systems. If HIMARS becomes a victim of the declining defense budget, a battery of six M198 towed 155mm howitzers will be added to each of the three light cavalry squadrons for artillery support, in the same manner as the self-propelled "HOW" batteries assigned to the heavy ACR squadrons.

Conclusion: The Next Storm

"When a team takes to the field, individual specialists come together to achieve a team win. All players try to do their very best because every other player, the team, and the home town are counting on them to win. So it is when the Armed Forces of the United States go to war. We must win every time."

— Gen. Colin L. Powell, USA
Chairman, Joint Chiefs of Staff

Dozens of enemy tanks and wheeled APCs were quickly dispatched by large-caliber smoothbore and 30mm automatic cannons in the initial close combat collision. The KEMs struck deeper into the target array, each missile a screaming banshee blur rocketing downrange at a mile a second before slamming into its victim in a cataclysmic kinetic impact.

Return fire was sporadic at first, delivered only by individual unsynchronized crews fighting desperately for their lives. But then its volume grew quickly, as the enemy partially recovered from the initial shock of the ground attack. Soldiers on both sides realized there would be no retreat today — the two combatants would flail at one another until the forces of one side lay wrecked and bleeding.

The American tanks seemed invincible. Hypervelocity penetrators ricocheted off their advanced composite armors, which absorbed the impact without shattering. Plasma HEAT jets were broken up by exploding reactive armor tiles thrust into their short linear pathway. Anti-tank missiles were sent on wild, uncontrolled free flight, or destroyed outright by impact with dozens of shotgun-like pellets expelled by the tanks' active armor systems, which tracked the incoming missiles and launched counter-missiles into their trajectories.

Enemy gunners searching for targets through visual sights screamed in shock as they were blinded by laser optical jammers, while their electronic

The Marine Corps

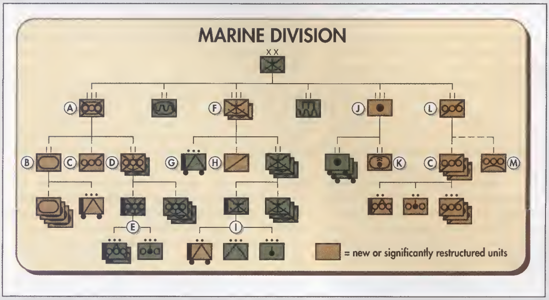
"The ultimate enabling task is provided by the Marines in their role as amphibious assault troops: to kick the door open when a situation requires it."

— Gen Carl E. Mundy, Jr.,
Marine Corps Commandant

Army light divisions can get to a theater of operations quickly, but lack the firepower to withstand a determined offensive conducted by a mechanized Third World enemy. Army heavy divisions provide the required muscle and staying power, but by the time they move to a US port and deploy by sea, the airborne and light infantry ahead of them may already have been overwhelmed. The Marine Corps is being reshaped to fill that vacuum by serving as the middleweight "enabling force" that provides the link between the Army's light and heavy forces.

This redesign is going on during the midst of a force reduction that will lower the Corps' strength from 199,000 to 159,000 by 1997, and the Marines are not happy with that new bottom line. With just under one-quarter of their operating forces deployed overseas at any one time, any reduction in manpower without a commensurate reduction in missions will increase the amount of time Marines will be away from their families (from an average of 157 days to 200 days a year), causing potential retention and morale problems. (Their own studies indicate a force of 175,000 *is* sustainable over the long haul without any mission degradation.)

Without Congressional relief, the reductions will be significant: 30 percent of their artillery, 50 percent of their tanks, and 26 percent of their fixed-wing air assets are scheduled to be cut. Ironically, the smaller base force and redefined role have resulted in a restructuring that will make their combat units more flexible and mission-capable across a broader spectrum of conflict than in the past. As their Commandant has said, "It's going to be a force that's faster-moving, not harder-hitting in firepower, but quick and agile."



Marine Air-Ground Task Forces (MAGTF). The MAGTFs include a ground combat element, a tactical aviation element with fighter-bombers and helicopters, and both land and seaborne support. Marine forces normally deploy as MAGTFs under a single commander. This tends to give them a higher degree of ground-air integration than is found in Army-Air Force operations.

Marine Expeditionary Units (MEU) "answer the 9-1-1 call." They are the smallest kind of MAGTF, formed from a reinforced battalion and a composite air squadron. Over the past two years, it was MEUs that formed the MAGTF in support of Operations Sharp Edge (Liberia), Eastern Exit (Somalia), and Provide Comfort (Northern Iraq). Normally, three are at sea at all times — one each in the Mediterranean, Western Pacific, and off Southeast Asia. Six others are recovering from deployment or preparing to deploy.

The larger Marine Expeditionary Brigade (MEB) — a reinforced regiment with a composite air group — is used independently or as an MEF's quick-reacting lead element. The *1st* and *7th MEBs* were the first Marines on the ground during Desert Shield, and it was the threat of an amphibious assault by the *4th* and *5th MEBs* that kept the Iraqis looking out to sea during Desert Storm. Later, it was an MEB that provided humanitarian assistance to Bangladesh, following a devastating typhoon there. MEBs are, however, being taken out of the structure as *independent* MAGTFs, while still being retained to provide the Corps more flexibility to task-organize specific crisis or contingency forces from within available assets.

The Marine Expeditionary Force (MEF) is the largest

MAGTF, consisting of a Marine division and an air wing. During the Gulf War, the *1st MEF* commanded Marine forces on land, while the *2nd* did so at sea. The downsized active force will be reduced from three to two-and-a-half MEFs. One full MEF will be maintained on each of the East and West Coasts. The *3rd MEF*, based in the Pacific, will be "roundout," with the missing air and ground pieces supplied by the Marine Reserve Force.

The Marine Division (MarDiv). The size of the Marine division is being reduced from 18,000 to around 14,000. In the most far-reaching restructuring since the Korean War, many units have been eliminated or reduced, to make way for improved and enhanced combat capabilities.

A. **The Combined Arms Regiment (CAR)** is a new type of unit, with organic tank, reconnaissance and motorized infantry. The CAR gives the MarDiv more tactical flexibility, while also providing a concentrated heavy maneuver force similar to that provided in Saudi Arabia by the British "Desert Rats," and later by the Army's Tiger Brigade.

The regiment represents much more than a simple regrouping of former divisional assets under a new administrative headquarters. It will be tactically employed as an integrated maneuver regiment, just like an army heavy brigade.

B. The old divisional **tank battalion** had 70 M60A1RP tanks and a company of 72 wheeled TOW launchers. The new regimental tank battalion will have 58 of the newer M1A1s and a platoon of 24 HMMWV-TOWs. The size of the four tank companies will be reduced form 17 to 14 tanks each, in line with the Army's organization. Right now the Corps can only afford a total of 221 tanks, to be spread between the Maritime Prepositioning Squadrons (amphibious transports stationed in the Pacific, Indian and Atlantic Oceans), the basic training base, the reserves, and the two remaining active tank battalions (the third battalion was recently disbanded). This leaves them one company short in each battalion, but the Marines are confident Congress will make up the dollar difference.

C. A permanently assigned **light armored reconnaissance (LAR) company** provides the combined arms regiment with its own dedicated recon and security capability. This is another new type of unit, organized into three recon platoons (each equipped with four LAV-25s, mounting the same 25mm cannon as the Bradley), one anti-tank section (four LAV-ATs with TOW launcher), and one mortar section (two LAV-Ms with 81mm mortar). The three LAR companies of the divisional recon battalion are organized in the same manner.

D. Expanded from one battalion to two in the restructured MarDiv, the **light armored infantry (LAI)** will function more like traditional mechanized infantry, and less like mounted dragoons. However, it will still lack the anti-armor punch of a mechanized battalion, since the 14 LAV-25s in each LAI company have no ATGM capability. The LAV is also less heavily armored than the Bradley, and can be penetrated by a 14.5mm heavy machinegun. The LAV, though, can be sling-carried by a CH-46 helicopter, while the Bradley cannot. It was for that reason — the ability to get LAVs rapidly ashore during amphibious operations — that survivability was traded for transportability.

E. The **LAI's heavy weapons company** is currently unchanged, with 16 LAV-ATs and 4 LAV-Ms providing the battalion with its mobile anti-tank and indirect fire capability. There's a possibility the Marines may form an additional LAI company in each battalion, distributing the heavy weapons assets between the four line companies.

F. A significant change to the MarDiv's structure has been the elimination of one of the three **Marine infantry regiments**, reducing the number of infantry battalions from nine to six. This decrease was made necessary by the increases elsewhere in the division. In essence, the MarDiv still has eight battalions of infantry — six leg and two motorized.

G. The **Anti-Tank platoon** of 24 "Humvee-TOWs" will be retained at the regimental headquarters, but the elimination of the third regiment left one platoon without a home. Since the Marines plan to keep their wheeled strength at 144 (excluding LAVs), the 24 machines must be redistributed, possibly to the CAR headquarters.

H. The old recon battalion was broken up, with one **recon company** assigned to each of the Marine infantry regiments. While intended to provide dismounted reconnaissance, the company can also conduct wheeled recon if provided with HMMWVs, and has a limited special operations capability.

I. The 24 Dragon Anti-Tank Guided Missiles (ATGMs) in the 6 **infantry heavy weapons companies** will be augmented by a new HMMWV-TOW section of 8 launchers, made available by redistributing the 48 machines left over when the tank battalion's anti-tank company was downsized to a platoon.

J. In another significant change, the Marines are retiring their old 8-inch and 155mm self-propelled (SP) howitzers and converting all of their tube artillery to M198 155mm towed pieces, rather than try to upgrade the SP weapons. This will also give them the option of bringing their artillery into a beachhead by helicopter, something they couldn't do with the heavier tracked models.

K. To make up for the loss of the mixed SP battalion, the Marines are adding a **Multiple Launch Rocket System (MLRS) battalion.** While shown in the wire-diagram as organic to the division, MLRS battalions will actually be held as MEF assets, and placed in general support of the divisions when dictated by the tactical situation.

L. Another new unit is the LAV-equipped **light armored recon battalion**, which replaced the old foot-mobile recon battalion. Its role will be similar to the Army's divisional cavalry squadrons, but without the helicopter assets — which belong to the Marine air wing.

M. The Marines are also considering an **air defense version of the LAV**, employing a gun-missile combination. Both the pedestal-mounted Stinger, and a hyper-velocity missile are being considered. The LAV-AD would provide a limited self-protection capability for the LAR battalion when it operated forward of the normal air defense umbrella. All other air defense assets would remain assigned to the Marine Air Wing.

The ***3rd Marine Division*** will have an active duty strength of about 7,000. It will consist of two infantry regiments (each short one infantry battalion), an artillery regiment with two battalions, and a unique "combat support battalion" with amphibious assault, engineer, and LAR companies. The combined arms regiment, plus the remainder of the infantry, artillery, and combat support, will be provided by the Reserves. The *4th Marine Division*, which was composed entirely of reserves, is gone.

The Marine Air Wing (MAW) is reducing its manpower from 16,000 to 12,000. Nine aviation squadrons are being eliminated (six F/A-18 Hornet and three AV-8B Harrier), along with 14 support squadrons. Like the Marine divisions, the *1st* and *2nd Air Wings* will be combat ready, and the *3rd Air Wing* — with an active duty strength of 3,500 — will be augmented by reservists.

The venerable Vietnam-era OV-10 Broncos are being retired. The number of AH-1W Cobra helicopters is being increased, while also being given a much-needed upgrade to their nightfighting capability. The Harrier is being retrofitted with a host of improvements designed to extend its useful life to the year 2010, with a limited number of a night attack version being produced. The F/A-18As will also be replaced by the newer "D" model.

What is not currently funded is the replacement for the aging CH-46 medium-lift helicopter. The V-22 Osprey — a tilt-wing aircraft able to take off like a helicopter and fly like a fixed-wing plane — was supposed to fill this requirement, but it has turned into a battle of wills between the Secretary of Defense (who killed it) and Congress (which is determined to fund it). The Marines are caught in the middle. The V-22 is essential for their vision of future amphibious warfare — rapid over-the-horizon assaults from the sea carried out by Ospreys and helicopters carrying infantry, LAVs and towed artillery, with the heavier stuff brought in by sea after the beachhead is secured by the "vertical envelopment." Close air support would be provided by Marine F/A-18s, newly integrated into the Navy's carrier air wings, and Harriers operating off smaller LHDs. Tomorrow's amphibious assaults may look far different than those conducted in the past at such places as Iwo Jima and Inchon.

fire control displays were burned out, their automatic filtering systems unable to withstand the sudden pulse of concentrated energy.

Artillery seemed to be impacting everywhere along the length of the shattered columns, disrupting attempts to regain control of an already incoherent and rapidly deteriorating tactical situation.

In desperation, the enemy commander ordered forward his attack helicopters, but lost more valuable minutes while his radio operators searched to find an unblocked electron path through the multi-frequency jamming. Then JSTARS picked up the helicopters' ground-hugging flight formations, and Commanche companies were directed on intercept courses. Air-to-air Stingers knocked most of the enemy choppers out of the sky well short of the Close Battle Area. Others were taken out by ground fire when they inadvertently flew into the range of rapid fire cannons in the smoke and confusion. Those that managed to successfully evade both enemy and "friendly" direct fire were then brought down by NLOS-ADs, launched against their defilade firing positions before they had a chance to get off a second shot.

There were soon no more enemy units available to commit; by sundown the battles were over. While the US forces reconstituted and prepared to resume the attack, the enemy's strategic reserves began forming a defensive line to the north and absorbing the shattered remnants of their assault echelons as they staggered back from their *Gehenna* in the south.

The war would last for another week before a cease fire went into effect, but its outcome had been decided in the first 24 hours. Outnumbered and seemingly outgunned, the Americans — with their superior soldiers, equipment, organization and doctrine — had once again prevailed. ✪

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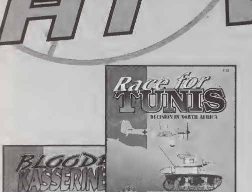

Race for Tunis

Late 1942, America has been in the war for less than a year. Rommel's *Afrika Korps* Is in flight from Montgomery's 8th Army, westward across the coast of North Africa. Now the Allies land in French North Africa and close in on Tunisia from two directions. The race for Tunis is on.

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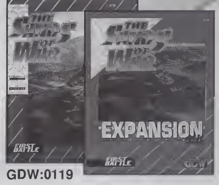

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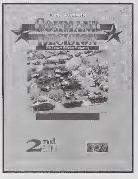

The revised **Command Decision** updates and combines the previous edition with **Combined Arms**, allowing play of any scenario from the 1930s to the 1990s. Using a vehicle scale of 1:5 and platoon-sized stands, **Command Decision** reproduces large-scale operational-level battles quickly and cleanly. Organizational bookl also offered seperately. **GDW:7402 $15.00**

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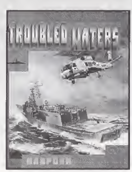

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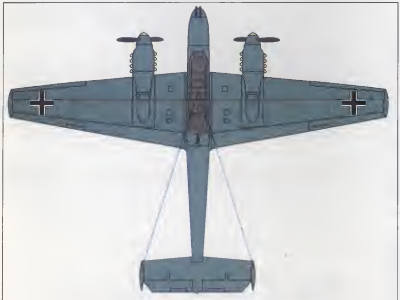
The "Strategic Fighter" Concept

by Timothy Kutta

Early in 1939, Hermann Göring, chief of the *Luftwaffe,* announced Germany had perfected a new type of fighter, called a *"Zerstorer"* (or "Destroyer"). This aircraft, a twin-engine, heavily-armed fighter, was supposedly capable of speeds as yet unattained by other current front line fighters.

German propagandists had a field day. They declared the plane could penetrate deep into any country and destroy its air force before those planes even had a chance to leave the runways. The rollout of the Messerschmitt Me-110 was to give Göring the instrument he needed to fulfill his dream of making airpower the supreme component in modern warfare. The *Luftwaffe's* command screened their personnel to find the best pilots and transferred them to the Destroyer squadrons. With those transfers, the Me-110 seemed poised to become the prime ingredient in developing and perfecting the German air force's new twin-engine, power-projection designs.

In August 1940, after performing well enough in Poland and France, the 110s ran headlong into the best of the Royal Air Force over England during the Battle of Britain. The RAF Spitfire and Hurricane pilots had not been impressed by the Destroyers' press publicity. In fact, they shot the 110s out of the air with such abandon, the Germans withdrew them from frontline service by the end of September.



Messerschmitt Bf.110-c

Wingspan: 53 ft. 4 in. (16.25m); *length:* 39 ft. 7 in. (12.07m); *height:* 13 ft. 6.5 in. (4.12m); *weight (loaded)*: 13,289 lb (6,028 kg); *maximum speed:* 336 mph (540 km/h) at 19,685 ft (6,000m); *ceiling:* 32,810 ft (10,000m); *range:* 680 miles (1,094 km).

The German disappointment with their 110s was not unique. Every major power in World War II developed its own version of the Destroyer. Only the United States was able to actually put the twin-engine, power-projection theory successfully into practice before 1945.

Origins

The thinking of Italian airpower theorist, Gen. Giulio Douhet, was fundamental in the development of World War II air doctrine. He believed any air bombardment campaign launched against the industrial base of an enemy nation would be unstoppable. He further believed multi-engine bombers would always be faster than single engine fighters. Their multiple power plants would, he claimed, enable the bombers to zoom past the slower single-engine fighters, thus obviating the need for escort aircraft to protect the bombers. Continuous attacks from such bombers, the theory went on, would soon drive the civilian population away from the factory centers, destroy the target nation's social infrastructure, and eventually force its government to surrender.

Douhet reasoned that if the bombers could not be stopped once they were airborne, the best defense against an opposing air force was to destroy its aircraft before they took off. Destroying the airfields would doubly hinder the aggressors.

The airman's theories flew in the face of those accepted by army generals and navy admirals of his day. He was so stridently vocal in their dissemination, in fact, he was eventually imprisoned for a year by the Italian government. But shortly after his death in 1930, his theories were known and being debated in the press and military establishments around the world.

If a government wanted to develop its air force along the lines of Douhet's theories, they would need not only bombers, but long-range fighters. The fighters had to be capable of reaching into enemy homelands and destroying the opposing air force there, while it was still on the ground.

The resultant search for a fighter design with enough power to fulfill such a mission led, around 1934, to aircraft designers' adopting the twin-boom configuration. The reason for it was simple — twin booms allowed the application of two engines, heavier armament, and longer range. In 1936, the Fokker company displayed a twin-engine, twin-boom design at the Paris air show. It was a radical looking aircraft, and it spurred interest in the idea in the countries that were soon to become combatants in World War II.

A Golden Age of Aviation

The 1930s were a time of tremendous advancement in aircraft design. That same decade saw the development of the ultimate in biplanes, followed shortly by the first jet aircraft.

In the field of military aircraft design, efforts were driven by a desire to come up with aircraft that would enable the various national armed forces to avoid the conditions of stalemate that had led to the trench slaughter of World War I. Every country sought a means of inflicting grevious damage on enemy nations, while risking few losses itself. Accordingly, every major nation raced to design and produce large bombers that could lay waste to the urban centers of the opposition.

Linked with Douhet's theories, the destroyer, or "strategic fighter," became the logical and natural adjunct to the growing bomber forces.

The planners and aircraft designers of the 1930s faced a threefold problem. First they had to develop bombers capable of carrying out the first part of Douhet's theory: the bombers had to be faster than the defending single-engine fighters. Second, in self-defense, they were compelled to develop single-engine fighters that could overturn the first part of Douhet's theory. Last, they remained wedded to the idea of the "strategic fighter," capable of penetrating enemy airspace and destroying his planes while they were still grounded.

The Destroyers

The builders of twin-engine fighters quickly saw the resultant machines were too large and unmaneuverable to successfully mix it up with agile single-engine planes. In a swirling dogfight, opposing pilots being equal, the nimbler single-engines would always win.

Strategic fighters were therefore developed to be faster than their single-engine counterparts, to enable the Destroyers to pick the time and place of battle. That, coupled with the fact the heavier aircraft could dive on unsuspecting foes and destroy them before maneuverability or pilot skill came into play, was believed sufficient to offset any advantages the single-engines might otherwise have. In most designs a second crew member was also added to handle more weaponry.

The overall military aircraft situation reached by the mid-1930s is outlined in tables 1-3.

Strategic Fighters in World War II

It's easy to see the strategic fighters were faster than the bombers and more heavily armed than than the single-engine fighters. But an old military maxim holds that no plan survives its first encounter with the enemy — and that held true with strategic fighters.

Table 1: Strategic Fighters of the Mid-1930s

Name	Country	Speed	Max Armament	Weight Empty
P-38E	USA	390 mph	1-20mm 4-50 cal	11,800
Me-110C	Germany	349 mph	2-20mm 4-7.92mm	11,200
Potez631/671	France	276 mph	2-20mm 6-7.5mm	6,526
KI-45	Japan	340 mph	1-37mm 2-20mm	8,818
Whirlwind	Britain	360 mph	4-20mm	7,840
PE-2	Soviet Union	373 mph	1-12.7mm	12,943
S.M.91	Italy	363 mph	5-20mm	14,110

Table 2: Single-Engine Fighters of the Mid-1930s

Name (1st Flew)	**Country**	Max Speed	**Armament**	**Weight**
HF-518 (1932)	Germany	205 mph	2-7.92mm	3,219
CR.32 (1933)	Italy	233 mph	2-7.7mm	2,921
Ki.10 (1935)	Japan	248 mph	2-7.7mm	2,998
I-15 (1934)	USSR	224 mph	4-7.62mm	2,597
P-26 (1932)	USA	234 mph	2-.30 cal	2,995
MS405 (1936)	France	248 mph	1-20mm 2-7.5mm	4,189
Gladiator (1935)	Britain	253 mph	4-.303 in.	3,476

Table 3: Bombers of the Mid-1930s

Name (1st Flew)	Country	Max Speed	Bomb Load
Hampton (1936)	Britain	265 mph	3,000 lbs.
S.M.79 (1935)	Italy	220 mph	2,515 lbs.
JU 88 (1936)	Germany	286 mph	3,968 lbs.
HE 111 (1935)	Germany	214 mph	2,200 lbs.
B-17B (1936)	USA	231 mph	8,000 lbs.
BLOCH (1934)	France	200 mph	3,527 lbs.

Germany at first used her Me-110s to great effect. The plane racked up impressive kill totals destroying much of the Polish, Norwegian, Danish, Dutch, Belgian and French air forces on the ground. Unfortunately for the 110s, though, they were increasingly called upon to fulfill the role of bomber escort when Germany's front line single-engine plane, the Me-109, proved too short-ranged for that job (and the advent of radar made interception of bombers feasible).

Much the same fate befell all the other strategic fighters, except for America's P-38. Only that plane managed to live up to the expectations of the pre-war theorizing.

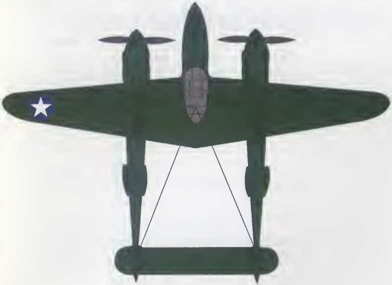
The P-38 "Lightning," was, in fact, the best and only really successful strategic fighter used throughout the entire war. Some will argue the P-38 was not really a Destroyer, that it was actually a pure fighter. Its size, weight, armament, range and speed seem to put it firmly in the latter class. But even though the American government and the plane's design team might never have mouthed the words "strategic fighter," that is what the specifications called for and that is what the engineers at Lockheed produced.

The P-38 started World War II already in service; it flew in every theater of war and ended the conflict still fighting. In fact, the top-scoring American Ace, Richard Bong, flew the P-38.

The reason for the American success with this type of aircraft was the ability of the U.S. aircraft industry to continually increase the performance of its designs. The P-38 variant table on the left shows what was accomplished.

Simply put, the success of the aircraft was due to the continued upgrading of its engines, which kept it competitive with its adversaries. More horsepower was injected into the P-38 on at least a yearly basis. In contrast, the Me-110 was only up-engined once, to a top speed of 370 mph. A glance at the main-line fighters of 1943 shows just how competitive the P-38 remained.

Thus the P-38 maintained the necessary speed advantage over the single-engine fighters to go on dictating the time and place of engagement. Its heavier armament also guaranteed a quick death to any opponent unfortunate enough to get in front of its guns, and its range still allowed it fly deep into enemy territory in search of prey. ✪



Lockheed P-38f Lightning

Wingspan: 52 ft. (15.85m); *length:* 37 ft. 10 in. (11.53m); *height:* 9 ft. 10 in. (2.99m); *weight (loaded)*: 20,000 lb (9,065 kg); *maximum speed:* 395 mph (636 km/h) at 25,000 ft (7,620m); *ceiling*: 39,000 ft (11,880m); *range:* 1,425 miles (2,000 km).

Table 4: P-38 Variants

Variant	Engine	Speed	Max Weight	Year
P-38E	(2) 1150 hp	390 mph	11,880	1941
P-38F	(2) 1225 hp	395 mph	15,900	1942
P-38G	(2) 1325 hp	400 mph	15,800	1942
P-38H	(2) 1425 hp	400 mph	15,900	1942
P-38J	(2) 1425 hp	414 mph	12,780	1943
P-38L	(2) 1600 hp	414 mph	12,800	1944

Table 5: Fighters of 1943

Name	Country	Speed	Max Armament	Weight
Spitfire Mk.VIII	Britain	408 mph	2-20mm 4-.303 in.	6,000
Zero A6M5	Japan	351 mph	2-20mm 3-13.2mm	4,175
Me-109G	Germany	387 mph	1-20mm 2-13mm	5,900
FW-190A-8	Germany	408 mph	4-20mm 2-13mm	7,000
P-38J	USA	414 mph	1-20mm 4-.50 cal	12,780

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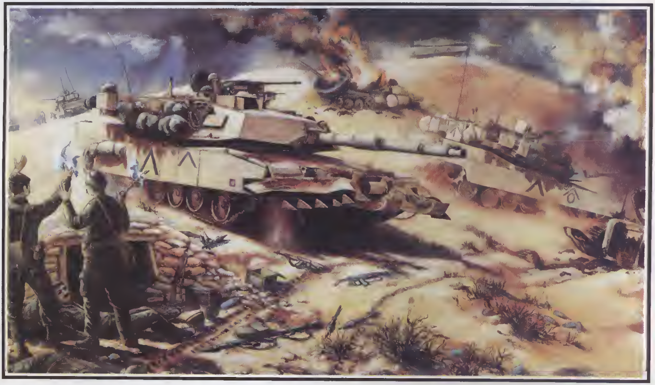
Frank M. Thomas

Painter
Soldier
Educator



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While serving as a field artillery officer with the 9th Infantry Division in Vietnam in 1967, Frank Thomas was selected by the U.S. Army Center of Military History to serve in its combat artist program. Thus his all-consuming passion with military art was born. Finally, in February, 1991, Lieutenant Colonel Thomas was recalled to duty as a combat artist for **Desert Storm**. The only Army combat artist to serve in two wars, he ventured across Kuwait and into Iraq's Euphrates River valley to paint U.S. soldiers at their finest.

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PYRRHIC VICTORY

by Mike Markowitz

Some time in 282 B.C., 10 ships of the Roman fleet, L. Valerius Flaccus commanding, rounded Cape Lacinium and entered the Gulf of Tarentum for the first time. According to an old treaty Rome had with that city, the Latins were in forbidden waters. Flaccus' mission may have been to test the treaty by provoking an incident, or it might have been strategic reconnaissance. Perhaps he was just "showing the flag," and providing moral support to pro-Roman factions in the Greek coastal towns along the Gulf.

When Flaccus' little squadron sailed (or rowed, if the day was calm) into the outer harbor of Tarentum, the reaction was immediate and violent. The outraged Tarentines quickly manned their superior fleet and overwhelmed the intruders. Flaccus was killed, four of his ships were sunk and one was captured. The prisoners were sold into slavery.

The Roman Senate sent an ambassador to ask the assembly of Tarentine for an apology, payment of compensation and return of the prisoners. The Tarentines laughed at the man's ungrammatical Greek and pelted him with excrement. Maintaining traditional Roman dignity, the ambassador held up his soiled toga and remarked that the Tarentines would wash it clean with their blood.

The resultant conflict had been brewing for years, as Rome's inexorable southward advance ran into territory controlled by Greek city-states along the coast. In 291, Rome had established the colony of Venusia, with 20,000 settlers, only two days' march north of Tarentum. In 282, the Roman Consul Fabricius helped the Greek town of Thurii defeat an attack by Lucanian tribesmen. The Tarentines regarded all this as outrageous interference in their traditional sphere of influence.

Taras

The city of Taras, better remembered by its Roman name, Tarentum, had been founded as a colony of Sparta in 706 B.C. For the Greeks of that era, southern Italy was the "Wild West," a frontier area inhabited by savage tribes, but rich in resources, agriculture and trade.

Located on an easily defended peninsula, Taras has an excellent natural harbor (modern Taranto was the main base of the Italian navy in 1940, when British carrier planes raided it and sank three battleships). It developed into one of the great seaports of the central Mediterranean, rivaling Siracusa and Neapolis. At its peak, around 367, Taras had about 40,000 citizens and could field the largest fleet in the Greek world, 30,000 mercenary infantry, and 4,000 excellent cavalry. (The inland plains were good horse country; for centuries the city's silver coins were stamped with a horse and rider, and "Tarentine" became the generic term for javelin-armed medium cavalry carrying rounded shields.)

The Tarentines relied on mercenaries because, unlike their Spartan ancestors, they had developed a taste for easy living. Their wealth enabled them to hire the best available leaders and troops. In 344, the Tarentines hired Archidamus, King of Sparta, who died heroically for them in 338, fighting the Messapians, an Illyrian tribe that had occupied the heel of the Italian boot.

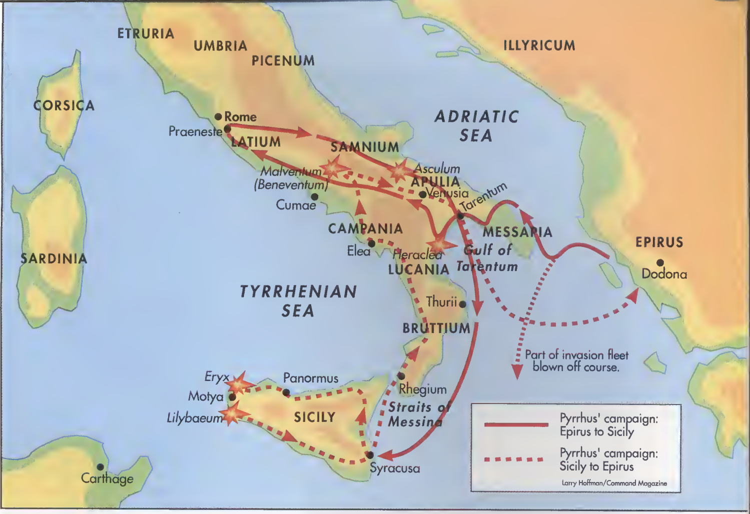
In 334, Taras faced a two-front war, with Messapians to the south and Lucanians on the west. The city called in Alexander the Molossian, brother of Olympias and uncle of Alexander the Great (who was just then about to begin his own career of conquest in the east). A later Roman historian probably made up the story, but, supposedly, the elder Alexander grumbled that he was going to Italy to fight men, while young Alexander was off to Persia to fight women. At any rate, Uncle Alexander defeated a combined army of Lucanians and Samnites at Poseidonia before a Lucanian javelin terminated his contract in 331.

In 303, the Lucanians were on the warpath again, and Taras hired Cleonymus, an ambitious prince of Sparta, who brought 3,000 of his own men and hired 5,000 more. He enlisted the Messapians, intimidated the Lucanians into making peace, and set himself up as military dictator of southern Italy, with a harem of 200 "well-born girls." The Tarentines were so revolted they revolted, and Cleonymus was soon forced to retire to a life of piracy, based in the swamps of Venetia far to the north.

In 282, faced with the threat of war with Rome, the Tarentines followed tradition and began looking around for a top military talent who might be seeking employment opportunities. They didn't have to look far. Pyrrhus, just defeated in a bid for the crown of Macedonia, had a veteran army and was willing to travel.

Who was Pyrrhus?

> *Antigonus...being asked who was the greatest soldier, said "Pyrrhus, if he lives to be old...." Hannibal, of all great commanders esteemed Pyrrhus for skill and conduct the first, Scipio the second, and himself the third.*
>
> — Plutarch, *Pyrrhus*



Larry Hoffman/Command Magazine

Pyrrhus, son of Aeacides, King of Epirus, was born about 316 B.C., on the rugged northwestern frontier of Greece. Epirus was famous for its large, fierce sheepdogs, and the shrine of Zeus at Dodona, one of the holiest sites in the Greek world. With fewer than a half-million inhabitants, the kingdom was an ally, rival, or satellite of Macedonia, depending on how the political winds were blowing at any given moment.

Pyrrhus was related to Alexander the Great through his mother Olympias, who was a princess of the Molossians, the dominant tribe in Epirus. When Pyrrhus was an infant, his father was overthrown; after a perilous escape, he was raised in exile at the court of Glaukias, King of Illyria. An Illyrian army installed Pyrrhus on the throne of Epirus when he was 12.

Athletic, intelligent and a natural leader, young Pyrrhus was soon drawn into the complex Wars of the Successors. He fought beside Demetrius The Besieger, as a junior cavalry officer, at the Battle of Ipsus (301 B.C.). Demetrius had married Pyrrhus' sister, and after his defeat at Ipsus, he made peace with Ptolemy, and sent his brother-in-law to Alexandria as hostage.

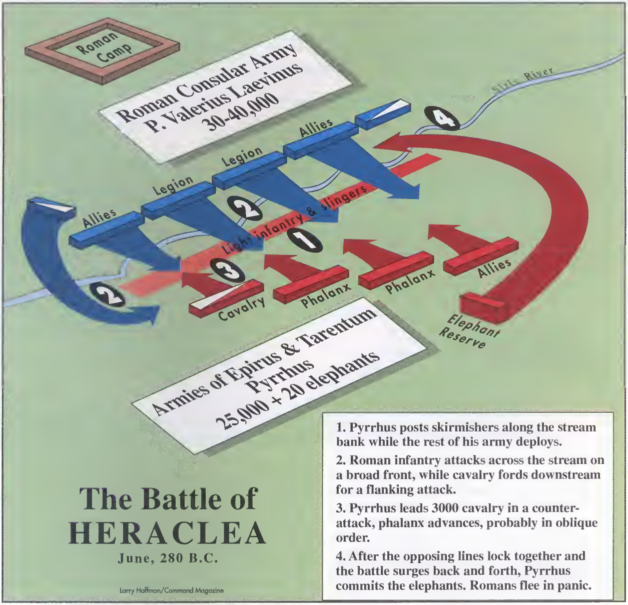
Pyrrhus' good manners, endurance and skill in riding and hunting, made such a favorable impression he was given one of Ptolemy's step-daughters in marriage. Ptolemy also gave Pyrrhus money and troops and sent him off to regain his own Kingdom in Epirus (he had been deposed in his absence). Along the way, Pyrrhus also helped himself to Thessaly and some outlying provinces of Macedonia.

That led to a short, glorious war between Pyrrhus and Demetrius, who had just proclaimed himself King of the Macedonians. Pyrrhus severely wounded one of Demetrius' generals in single combat, and took 5,000 Macedonian prisoners. The jubilant Epirote troops hailed Pyrrhus as their "Eagle," and he graciously replied that their arms were his wings. According to Plutarch, Pyrrhus also managed to undermine Demetrius' army with some clever psychological warfare:

> *There were some also whom Pyrrhus himself sent into the camp; pretended to be Macedonians, and said that now was the favorable time to rid themselves of Demetrius and his severity, by going over to Pyrrhus, a man who was gracious to the common folk and fond of his soldiers.... So Pyrrhus came up, took the camp without a blow, and was proclaimed King of Macedonia.*

The triumph was brief, however, since another of the Successor kings, Lysimachus, promptly came down from Thrace and threw Pyrrhus out of Macedonia.

Pyrrhus might have settled down then, in 281, to rule his own kingdom in peace, but a man who



The Battle of HERACLEA

June, 280 B.C.

1. Pyrrhus posts skirmishers along the stream bank while the rest of his army deploys.

2. Roman infantry attacks across the stream on a broad front, while cavalry fords downstream for a flanking attack.

3. Pyrrhus leads 3000 cavalry in a counter-attack, phalanx advances, probably in oblique order.

4. After the opposing lines lock together and the battle surges back and forth, Pyrrhus commits the elephants. Romans flee in panic.

Larry Hoffman/Command Magazine

modeled himself on Alexander the Great, and even claimed to talk to Alexander in his dreams, needed something great to conquer. Just then ambassadors arrived from Tarentum, across the Adriatic in Italy, inviting Pyrrhus to come over and teach a lesson to some barbarians who called themselves "Romaioi," or "Romani," or something like that.

Heraclea, Summer 280 B.C.

Pyrrhus immediately dispatched an advance guard of 3,000 light cavalry under Cineas, his senior advisor. He followed with the rest of his army: 20,000 infantry, 3,000 cavalry, 2,000 archers, 500 slingers, and 20 elephants.

We do not know what Pyrrhus' strategic objective or operational plan was when he landed in Italy. Tarentum was threatened by Rome and he had come to help. He declared martial law, closed the public baths, canceled festivals, and conscripted all the able-bodied male citizens he could round up. Many of the fun-loving Tarentines left the city; this was not the kind of help they had bargained for.

The Tarentine ambassadors had promised that all the Greek cities and native peoples of Italy would rally to Pyrrhus' side, providing 350,000 infantry and 20,000 cavalry. Pyrrhus probably discounted those inflated claims, but he could not afford to sit around waiting for allies to materialize. The nearest Roman army was advancing through Lucania, to the west, plundering the countryside as it came.

Those Romans (possibly two legions and twice that number of allies) were commanded by the Consul P. Valerius Laevinus. Following the diplomatic etiquette of the time, Pyrrhus sent a message to Laevinus, offering to negotiate Rome's grievances with Tarentum. Laevinus bluntly replied that

Rome neither wanted Pyrrhus as mediator, nor feared him as a foe.

The Romans encamped near the Greek town of Heraclea, on the far side of the River Siris, actually a small stream, which flows into the Gulf of Tarentum. Pyrrhus rode up, expecting to see an unruly mob of tribal warriors. Instead, he was amazed by the orderly way the Roman camp was laid out, with guards on watch and relieved at regular intervals.

"The discipline of these barbarians is not barbarous," he told a staff officer, "but the result will show us what it amounts to."

Pyrrhus posted a picket line of light infantry to hold the river bank while the rest of his army came up. But the Romans immediately crossed with infantry and cavalry, forcing the skirmishers to withdraw. To gain time for his phalanx to deploy, Pyrrhus charged with 3,000 cavalry. His horse was killed under him.

During a lull in the melee, he swapped armor with Megacles, one of his Companions. That was a standard Hellenistic ruse, used to make the commanding general less conspicuous, so he could get near the action without becoming the target of every enemy javelin in range. However, when Megacles, wearing Pyrrhus' purple cloak and gilded helmet, was cut down by an enemy trooper, Roman morale soared and the Epirotes were in despair until Pyrrhus rode down the line, bareheaded and waving as though he were on parade.

The battle surged back and forth — seven times, says Plutarch, "as each side fled back or pursued." Then Pyrrhus sent in his elephants.

Roman legionaries could be depended on to stand up against anything on two legs. They had fought Etruscans, Samnites, Lucanians, and towering red-haired Gauls. But they had never seen four-ton Indian elephants with towers on their backs. Roman horses panicked, men were trampled and tusked, and the army routed off the field, pursued by Pyrrhus' Thessalian cavalry.

There are wildly conflicting sources for the casualties at Heraclea. The Romans lost either 7,000 or 15,000; Pyrrhus lost 4,000 or 13,000. Perhaps the larger totals actually include the wounded, while the smaller are only those killed in action. In any case, the Romans were able to replace their losses easily, while Pyrrhus had lost many of his crack troops and some of his most experienced officers. To replace them, only rough bands of Samnites and Lucanians drifted down out of the hills to join up with Pyrrhus in hopes of loot and pillage.

The Romans tried to make light of their defeat — referring to Pyrrhus' elephants as "Lucanian cows." But they remembered. Writing almost 300 years later, the historian Titus Livius quotes a survivor of the great Roman disaster at Cannae, speaking to the Senate about other fiascoes: "In both those battles, at the Allia with the Gauls, at Heraclea against Pyrrhus, what made defeat shameful was not our losses, but the panic-stricken flight of our troops."

Following up his victory, Pyrrhus marched on Rome, either because he expected the city to fall now that its army had been beaten, or because he hoped to rally Rome's allies and client states to his banner. But Rome, and her allied cities, shut their gates to him. Roman policy had been crafted skillfully enough that it gave her allies a stake in her survival. The Romans, still under Laevinus, called in legions on duty in other provinces, raised new troops, and prepared for another campaign.

From the hilltop town of Praeneste, he supposedly saw the smoke and dust of Rome on the horizon. But lacking siege engines and engineers, and unwilling to face the rigors of a winter siege surrounded by hostile, devastated territory, Pyrrhus fell back to Campania for the winter.

Ausculum, Spring 279 B.C.

The following spring, Pyrrhus advanced into Apulia, probably to recruit new allies among the coastal tribes by knocking out the Roman colonies along the Adriatic coast. (The coastal tribes — Frentani, Vestini, Picentenes — were of Illyrian stock. Having grown up at the Illyrian court, Pyrrhus probably spoke their language and understood their culture.) But the Romans blocked his way with the combined consular armies of P. Sulpicius Saverrio and P. Decius Mus.

Pyrrhus camped south of the Aufidus River, upstream from the spot where the Battle of Cannae would be fought 63 years later. The Romans camped along the wooded banks of a smaller stream, the Carapelle, a few miles to the north.

Dionysius gives a detailed order of battle for Pyrrhus' army, possibly based on the king's memoirs, lost forever when the Library of Alexandria burned: "The forces on the king's side numbered 70,000 foot, of whom the Greeks...amounted to 16,000; on the Roman side there were more than

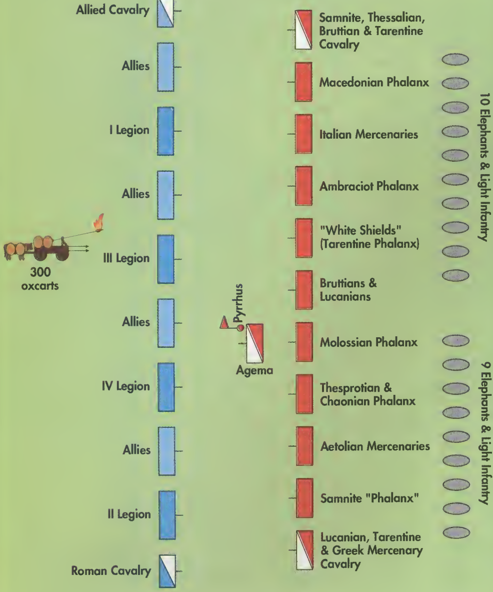
How to Declare War (Against an Overseas Opponent)

According to ancient Roman custom, after the priests of Jupiter sacrificed an ox, they would dip the point of a javelin in the blood and hurl the weapon into enemy territory. This formalized a declaration of war, and signified the approval and blessing of the Roman gods for the endeavor.

Since Pyrrhus had invaded from across the sea, however, there was no land in Italy where the sacred javelin could be thrown, and the tiny Roman fleet had no way to reach Epirus. The problem was solved with typical Roman practicality. A deserter from Pyrrhus' army was given money to purchase a small plot of land just outside Rome. Since the parcel now belonged to an Epirote subject, it became (ritually, if not legally) Epirote territory, and the ceremony could thus be completed.

The Battle of ASCULUM

Summer, 279 B.C.



Notes: This is the Order of Battle given by Dionysius af Halicarnassus, and possible derived from Pyrrhus' memoirs. Raman legians at this period were about 4000 inf. + 200 cav. The cavalry af all the legions present would be grouped on the flanks af the army. Pyrrhus' Phalanx units might have been 2048 or 4096 men. Roman allies generally had lighter equipment than legionaries. and faught in small units (500 men) that might be grouped inta legian-sized blocks. Pyrrhus' Allies and Mercenaries were probably equipped as peltasts (javelins) or hoplites (short spears) rather than phalangites. Pyrrhus' elite hypaspists are nat mentianed in this saurce; they might have been in reserve with the elephants, or used in small units to provide flexible "jaints" between the rigid phalanx blocks.

70,000, about 20,000 being from Rome itself. Of horse the Romans had 8,000, while Pyrrhus had slightly more, as well as 19 elephants."

The Romans deployed four legions in a single line, alternating with mixed blocks of allies: Latins, Campanians, Sabines, Umbrians, Volscians, Marrucini, Peligni and Ferentani.

The surviving accounts don't really give a clear idea of the course of the battle. Pyrrhus sent his infantry across the stream, hoping to force the Romans into more open terrain. He wanted to maneuver and use his reserve striking force: "the light armed troops and the elephants he divided into two groups and placed them behind both wings at a reasonable distance, in a position slightly elevated above the plain."

The Romans held their ground all day against repeated assaults. Nightfall ended the battle, and both armies trudged wearily back to their camps. Then Pyrrhus did something brilliant; he sent his light infantry forward during the night to take control of the broken terrain where the battle had been fought.

The next morning, Plutarch says, "The Romans, having no opportunity for sidelong shifts and counter movements, as on the previous day, were obliged to engage on level ground and front to front."

One Roman legion in the center routed the Lucanians and Bruttians opposing it, then wheeled inward, outflanking the Tarentine phalanx. Then Pyrrhus committed the reserve, "with great numbers of slingers and archers in the spaces between the elephants." The Romans attempted to counter by springing their new (and ultimately abortive) countermeasure, a force of 300 anti-elephant oxcarts (see sidebar).

Eventually the Romans were driven back to their camp with heavy losses. There Gaius Numicius, a front-ranker (*hastatus*) of the Fourth Legion, won undying glory by hacking off the trunk of one elephant, thereby proving the beasts were mortal.

Then Pyrrhus' luck ran out. The Daunians, a local tribe of Roman allies (Dionysius credits them with "4,000 foot and 400 horse") straggled in a day late, right into the rear of Pyrrhus' army. From a nearby hilltop, they tried to make out which side was which in the swirling dust of battle. They scratched their shaggy heads, shrugged, and rand down gleefully to pillage the nearest camp. By the time Pyrrhus arrived with a relief force of cavalry and elephants, the Greek camp was in flames and the

Daunians had taken to the hills again with their loot.

> *The forces of Pyrrhus, having lost their tents, pack animals and slaves, and all their baggage, encamped upon a height where they spent the following night under the open sky, without either baggage or attendance, and not well supplied with even the necessary food, so that many wounded men actually perished, when they might still have been saved had they received assistance and care.*
>
> —— Dionysius, xx, 3.

One source gives the Roman casualties as over 6,000, while Pyrrhus lost 3,500 killed. Plutarch says the casualties of both sides together totaled over 15,000, and that Pyrrhus himself was wounded in the arm by a javelin. When someone congratulated him on his victory, he made the famous reply, "If we are victorious in one more battle with the Romans, we shall be utterly ruined."

The Romans again quickly replaced their losses, "as if from a fountain gushing forth," while Pyrrhus had already exhausted the recruitment potential of his own kingdom, and his Greek and Italian allies were becoming demoralized by the prospect of a long war.

Meanwhile, back in Greece, a migrant horde of Galatians had invaded Macedonia, wiping out the king and his army. That ruler, Ptolemy Keraunos, son of Ptolemy I of Egypt, had snatched the crown in 280 by assassinating Seleucus. Pyrrhus considered returning to what was left of Macedonia to make a grab for the tottering throne.

Then some ambassadors from Sicily arrived to make Pyrrhus a new offer. He could be the ruler of a rich, fertile, civilized island, instead of these dirt-poor, barbarian-ravaged Greek uplands. They offered him the cities of Siracusa, Akragas and Leontine, if he would just drive the Carthaginians off Sicily for good.

The Sicilian Connection

In the third century B.C., Sicilia was the jewel of the Mediterranean. Today's poverty-stricken island, ravaged by millenia of war, overgrazing, deforestation, erosion, and the Mafia, bears little resemblance to the lush, green paradise described by the ancient historians.

Sicilia seemed to have a fatal attraction for the Greeks. In 415 B.C., the Athenians, embroiled in the endless Peloponnesian War against Sparta, dreamed up a crackpot scheme to conquer the island, adding its vast resources to their diminished treasury. Athens launched the most splendid and expensive armada ever to sail from a Greek city — 250 ships and 25,000 men. The resulting disaster before the walls of Siracusa in 413 permanently ended Athens' dream of empire.

Another player on the Sicilian stage was Carthage, only a 100 miles across the sea. For centuries, Carthage had struggled with the strong Greek cities of Sicilia for control of the island. Agathocles, who became tyrant of Siracusa in 317, even carried the war to Africa, besieging Carthage unsuccessfully in 307.

Pyrrhus had married Lanassa, a daughter of Agathocles. She bore him a son (named Alexander), and gave him an interest in the city's turbulent politics. After the death of Agathocles in 289, Siracusa sank into civil war. Carthage took advantage and launched a new attack on the city.

It was at this point Pyrrhus was invited to intervene by Thoenon and Sosistratus, leaders of the contending factions. The situation was grim, with 100 Carthaginian ships blockading the port, while their army invested the land walls and ravaged the surrounding farmland. (Diodorus says they had 50,000 men, probably a wild exaggeration.)

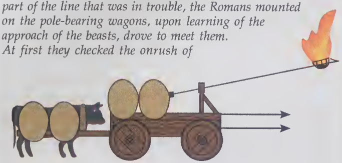
In September 278, Pyrrhus embarked from Tarentum, taking the Tarentine fleet (60 ships), the elephants, 8,000 infantry and 1,200 cavalry (about half his army). He put in briefly at Tauromenium (Taormina), where the local warlord provided

Oxcarts vs. War Elephants

Outside the line they stationed the light-armored troops and 300 wagons, which they had prepared for the battle against the elephants. These wagons had upright beams on which were mounted moveable transverse poles that could be swung in any direction. On the ends of the poles were tridents, spikes or scythes of iron…. Many of the poles carried fire-bearing grapnels wrapped in tow and daubed with pitch, which the men in the wagons were to ignite as soon as they approached the elephants and then rain blows with them upon the trunks and faces of the beasts. In addition, the wagons, which had four wheels, carried archers, hurlers of stones and slingers throwing iron caltrops…

When the king had ordered the elephants to be led up to the part of the line that was in trouble, the Romans mounted on the pole-bearing wagons, upon learning of the approach of the beasts, drove to meet them. At first they checked the onrush of the beasts, smiting them with their engines and turning the fire-bearing grapnels into their eyes. Then the men stationed in the towers [on the backs of the elephants] *no longer halted and hurled down javelins from above, and the light-armed troops cut through the wicker screens protecting the wagons, and hamstrung the oxen, so the crews of the machines leaped down and fled for refuge to the nearest infantry, throwing them into confusion.*

— from Dionysius of Halicarnassus, *Roman Antiquities*, Book XX. 1-2.



troops and supplies, then disembarked at Catania, 20 miles north of Siracusa. The residents greeted him like an Olympic hero, crowning him with a gold wreath. The Carthaginians abandoned their siege of Siracusa and prudently fled, while Pyrrhus made a triumphal entry.

> *The king took over the missiles, engines of war, and such equipment as was in the city; the ships he took over were 120 decked vessels, 20 without decks and the royal "niner." The total, including the ships he had brought with him, now amounted to a fleet of more than 200.*
>
> — Diodorus, xxii.8.

Pyrrhus: A Chronology

Year B.C.	Event
390	Rame sacked by Gauls.
367	Furius Camillus defeats Gauls, reorganizes legion.
331	Alexander the Malassian killed by Lucanians.
323	Alexander the Great dies in Babylan.
321	Samnites humiliate Rome at Battle af Caudine Farks.
319	Pyrrhus barn.
317	Agathacles becomes tyrant of Siracusa.
307	Pyrrhus becames King of Epirus.
304	Romans defeat Samnites at Bovianum.
303	Treaty with Tarentum bars Raman ships fram Gulf.
301	Battle af Ipsus, cambined Successars defeat Demetrius.
295	P. Decius Mus defeats Etruscans, Gauls and Samnites.
293	M. Curius Dentatus crushes Samnites at Aquilonia.
289	Death af Agathacles.
284	Gauls annihilate Roman army af Metellus at Arretium.
283	Etruscans and Gauls defeated at Lake Vadima.
282	Tarentines attack Roman naval squadron.
281	Tarentines ask Pyrrhus for aid against Rome.
280	Pyrrhus defeats Laevinus at Heraclea (June).
279	Ptolemy Keraunas killed fighting Gauls in Macedon.
279	Battle of Ausculum (Spring).
278	Antigonus Gonatas defeats Gauls invading Greece.
278	Pyrrhus goes to aid Siracusa (September).
277	Raman alliance with Carthage against Pyrrhus.
276	Pyrrhus abandans siege af Lilybaeum.
275	Pyrrhus returns to Italy, Battle of Beneventum.
272	Milon surrenders Tarentum to Romans.
272	Pyrrhus killed in street fighting in Argas.
270	Romans take Rhegium, conquer all southern Italy.
265	First Punic War breaks aut at Messana.
231	Epirus becames Roman pratectarate.

The "niner" (or *enneres*) was a Hellenistic dreadnought with nine men on each oar. Most of the Siracusan fleet was less impressive — only half-manned and poorly maintained after years of civil war.

Still, more recruits began pouring in to join Pyrrhus' army: 10,000 Siracusans, 4,000 infantry and 500 cavalry from the inland city of Leontini, 8,000 infantry and 800 cavalry from Akragas halfway up the south coast.

The only thing standing between Pyrrhus and the title of King of Sicilia was a chain of Carthaginian coastal fortresses dominating the western end of the island. Pyrrhus personally led the assault on the hilltop citadel of Eryx, then stormed Panormus (Palermo), which has the island's best harbor. Only Lilybaeum (Marsala) held out, superbly fortified on its narrow peninsula.

> *The Carthaginians brought over from Libya to Lilybaeum a considerable army, and having control of the seas they transported a large amount of grain, and engines of war, and missiles in incredible quantities.... So great a number of catapults, both dart-shooters and stone-throwers, that there was not room on the walls for all the equipment.*
>
> — Diodorus, xxii.10

The Carthaginians, who preferred bribery over combat, offered Pyrrhus a large sum of cash to go away. But the Sicilian Greeks were determined to drive their traditional foes completely off the island. Pyrrhus brought up his own siege train, and sent waves of attackers against the fortress for two months. Since the walls were built on rocky ground, mining was almost impossible. With casualties mounting daily, Pyrrhus decided to abandon the siege.

Lilybaeum proved to be the high water mark of his career. "What a wrestling ground we leave for Rome and Carthage to fight in," he said when he left Sicilia forever. While returning to Italy, his transport fleet was intercepted by the Carthaginians and badly mauled.

Beneventum, Summer 275 B.C.

In the autumn of 276, Pyrrhus was back in Tarentum with 20,000 foot, most of his elephants, and 3,000 horse. The Tarentines and Samnites had kept up the war while Pyrrhus was off in Sicily, and they now bore a grudge for the way he had left them unaided to face the wrath of Rome. They had few options, however; they had to accept Pyrrhus' leadership or resign themselves to learning Latin.

Strapped for cash, Pyrrhus had seized the treasury of the Temple of Persephone at Locri. The goddess of the underworld expressed her displeasure by sending a violent storm that wrecked part of Pyrrhus' fleet. The troops began to mutter that Pyrrhus' sacrilege had permanently ruined his luck.

In May 275, two new Roman consuls took the field. Cornelius Lentulus Caudinus occupied Lucania with one army, while Manius Curius Dentatus ("The Buck-Toothed") led the other army into the heart of Samnium, occupying the key hill town of Malventum.

Outnumbered, Pyrrhus boldly split his forces, sending a detachment to hold Lentulus in Lucania, while he took the main body north against Curius. Hoping to achieve surprise with a dawn assault on the Roman camp, Pyrrhus led his best men and elephants on a long night march through densely wooded hill country. He misjudged the distance; their torches burned out, and the troops got lost and straggled.

At daybreak Roman pickets saw Pyrrhus advance guard still struggling into position on the heights overlooking the camp. Curius quickly made the traditional pre-battle ritual sacrifice; the omens were good, so he attacked.

The Roman advance carried them down into the plain, where Pyrrhus finally managed to rally his troops, deploy his phalanx, and launch a flanking counterattack led by elephants and cavalry. He soon drove the Romans back to the walls of their camp.

But Curius had held back a large reserve inside the camp, and now he threw those fresh troops into battle. "Down they came from their strong places," says Plutarch, "and hurling their javelins at the elephants, compelled them to wheel about and run back through the ranks of their own men, causing disorder and confusion."

"The Romans," Dionysius recorded, "killed two elephants and hemming eight others in a place that had no outlet, took them alive when the Indian mahouts surrendered them." Four captured elephants graced the dazzling triumph of Manius Curius Dentatus in Rome in February 274, the first time such beasts had ever been seen in the city.

There is no record of the exact location of the battle, or the Roman casualties. Eutropius says 23,000, and Orosius 33,000, of Pyrrhus' soldiers were killed, as well as 1,300 men taken captive.

Pyrrhus managed an orderly retreat to Tarentum before the army of Lentulus could come up and trap him. He left a small garrison under Milon to hold the town and sailed back to Epirus in the autumn of 275. He still had 8,000 infantry and 500 cavalry left.

Pyrrhus immediately went to war against the new King of Macedonia, Antigonus Gonatas, son of Demetrius the Besieger. He next tried to conquer the territory of Sparta, only to fail again. In 272 he was killed in a street fight in the town of Argos, struck on the head by a roof tile thrown by an old woman. A soldier hacked off Pyrrhus' head with an Illyrian short sword, and Antigonus' son carried it like a trophy to his father.

> *Antigonus, however, when he saw and recognized the head, drove his son away, smiting him with his staff and calling him impious and barbarous; then covering his face with his cloak he burst into tears, calling to mind Antigonus his grandfather and Demetrius his father, who were examples in his own family of a reversal of fortune.*
>
> — Plutarch, *Pyrrhus*, xxxiv, 4-6.

Why Rome Won

Did Pyrrhus have a chance? It could be argued Rome was unbeatable. Pyrrhus fought Rome for only four years — allowing for the two years he wasted in Sicily. He won one battle decisively (Heraclea), fought one to a draw (Ausculum), and was worsted in a third (Beneventum). In comparison, Hannibal would later spend 14 years marching up and down Italy and still couldn't beat Rome, even though he smashed three successive Roman armies — at Trebia (218), Lake Trasimene (217), and Cannae (216) — and was narrowly beaten at the Metaurus (207).

The error that ruined both Pyrrhus, and his later admirer Hannibal, was thinking that the Roman army was the objective. With a large population base and efficient recruiting system, the Romans could always replace an army. What they could not replace was the city of Rome itself, home to the Senate, temples of tremendous symbolic importance, and well over 100,000 people.

So why didn't Pyrrhus drop everything else and focus on the main objective, the capture of Rome?

Siege combat had cost Phillip of Macedon an eye, Alexander a near-fatal chest wound, and Demetrius his reputation as a winner. Pyrrhus did not feel he could afford to take such risks. His army was held together only by his personal charisma. If he fell, his sons would not automatically succeed him; at best, they might become ornamental house guests at the court of some other Hellenistic king.

The Romans, on the other hand, were not dependent on a single man. They elected a steady stream of consuls to command their armies. Those men were not military geniuses, but they all had served in the ranks and knew the basics. Decius Mus was the son and grandson of commanders who had sacrificed their own lives to rally their armies. That was the kind of behavior Romans expected from their consuls.

The Romans respected Pyrrhus as an honorable enemy. It would be another 1,000 years or so before the idea of chivalry became part of European culture, but in his generous treatment of prisoners and his courtesy to "barbaric" Roman envoys, Pyrrhus was already practicing it. Plutarch's judgement, based on primary sources lost in antiquity, is hard to challenge:

> *Thus fell Pyrrhus from his Italian and Sicilian hopes, after he had consumed six years in these wars, and though unsuccessful in his affairs, yet preserved his courage unconquerable among all these misfortunes, and was held, for military experience, and personal valor and enterprise, much the bravest of all the princes of his time; only what he got by great actions he lost again by vain hopes, and by new desires of what he had not, kept nothing of what he had. So that Antigonus used to compare him to a player with dice, who had excellent throws, but knew not how to use them.* ✪

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Great Campaigns, Hollow Victories

The Expedition to Abyssinia (1868) and the Gulf War (1991)

by Thomas D. Morgan

[Ed's Note: The sidebar and orders of battle for this article were provided by Andrew Preziosi.]

Two Great Campaigns

The kind of brilliant success attained by the British in Abyssinia in 1868 and by the US-led Coalition in Kuwait in 1991 are found only rarely in the annals of military history. The Abyssinian (now called Ethiopia) Expedition is an example of a classic mid-Victorian military campaign, and Desert Storm represents the epitome of modern, doctrine-based mechanized warfare.

There had never been a campaign like the British expedition to Abyssinia. It proceeded with all the decorum and inevitability of a dress parade in London. As with the Gulf War, there was no secret about the Abyssinian Expedition during its preparation, and its mission was debated at great length in the press of the time. Never before was a colonial campaign watched by so many around the world.

The principal antagonists of both wars were strong personalities. The defeated indigenous leaders in both cases were characterized as mad dogs let loose, evil tyrants even when judged by the savage standards of their own societies. Both of the victorious military commanders were seen as the most promising and accomplished professional soldiers of their day.

Sir Robert Napier in 1868.

Yet, despite the glory inherent in waging successful military campaigns, the results of both were hollow victories. Neither campaign worked to ensure peace and stability in the regions in which they were fought.

The Power of Tyrants

The Abyssinian campaign was brought on by Theodore III, the Coptic Christian Emperor of that land. He was a tyrant who had consolidated his rule by defeating a host of rivals in a series of ruthless tribal wars, much as Saddam Hussein solidified his power in Iraq through bloody purges and fighting within the Ba'ath Party. Both men were also alike in that they shared the realization their backward lands needed modernization.

Theodore had started out as a petty chieftain named Kassa. He crowned himself emperor in 1855, and his reign at least began well. He reformed Abyssinia's legal and administrative systems, while competing with Egypt and other local powers for trade and political influence. He considered himself a crusader against the Moslems, and seemed to be growing into both a talented administrator and courageous warrior-leader. After the death of his first wife, though, he grew emotionally unstable and erratic in the 1860s, and demonstrated an increasing tendency toward alcoholic dementia.

In 1862, a personal letter Theodore sent to Queen Victoria was intercepted by the Foreign Office in London, where it was read, filed and forgotten. After waiting over two years for an answer, Theodore angrily imprisoned his two British consuls, along with 30 other resident European men and their families — giving him a total of 58 hostages.

A three and half year diplomatic cat-and-mouse game followed as the Emperor alternately released and rejailed the Europeans. (These moves depended on nothing more than his mood, and when freed, he always kept them from leaving the country.) Finally, after numerous and fruitless diplomatic exchanges, some signed by Queen Victoria herself, military action seemed the only option remaining to the British. In August 1867, Her Majesty's Government formally demanded Theodore release all his European prisoners. When that demand went unanswered, London gave orders for war.

Confident Commanders

Theodore's ill-treatment of British and European captives brought retribution in the form of an Anglo-Indian Army led by Lt. Gen. Sir Robert Napier, then serving as commander of the Bombay Army of India. Napier was an engineer with many years of experience campaigning all across India. He was a hero of the defense of Lucknow during the Indian Mutiny in 1857, and had headed a successful expedition to China in 1860. In 1868 he was 56-years-old.

The Coalition effort in the Gulf War was personified by Gen. H. Norman Schwarzkopf. He, too, was an experienced and dedicated professional soldier, with an advanced degree in physics. A graduate of West Point and the son of a West Point general, he was 56 years-old in 1991. Schwarzkopf was a combat veteran who had served at many levels, from advisory duty and battalion command in Vietnam to joint command of the Grenada invasion. He had also commanded a division and corps before heading the US Central Command (CENTCOM).

Both generals were confident of their professional abilities. Their outgoing personalities were what their soldiers remembered best about them, as well as the assurances they gave that all would come out right in the end. Schwarzkopf and Napier knew exactly where they were going and why. Both had been educated and trained in the military arts by design, not accident. Their adversaries, Theodore and Hussein, were not schooled in warfare; they had only excessive pride and the need to preserve an inflated sense of personal dignity.

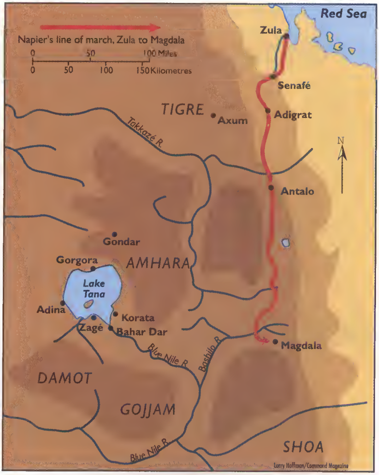
The Sinews of War

Both Schwarzkopf and Napier directed war machines that were large for their times, and both did so in an intelligent and deliberate manner. They set their intelligence staffs to work, examined maps and reports, conducted reconnaissance of the area of operations, and used their own expertise to develop war plans.

Logistics more than anything else drove the two campaigns. The provision of food, water, fuel and ammunition raised more difficulties than the enemy armies. As it turned out, the tactics could have been less than perfect, but there could have been no slip ups in logistics if victory were to be attained.

Weather drove both campaigns' timetables — the December to June dry season in Abyssinia, and the December to April cool season on the Arabian peninsula.

The troop deployments were complicated in both situations. Vast organizations came to Abyssinia from Calcutta, Bombay, Liverpool and London, in all types of ships. They converged on the Red Sea port of Zula at appointed times, just as great convoys of ships later arrived at the Gulf ports from Europe, the United States, and the Pacific.



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Napier's and Schwarzkopf's armies were similar in that both had recently gone through intense periods of reform and modernization. After 1855, the British armed forces moved away from being a mere aggregate of regiments and began to resemble a unified modern army under the ultimate command of a single, politically responsible minister. By 1868, the British army had put the confusion of the Indian Mutiny and Crimean War behind it. Infantry drill was still complicated by modern standards; the "square" was still in use, and brightly colored uniforms still worn, but only because they were effective against native armies. The evolving Victorian army was kept honed by participating in campaigns conducted almost nonstop against an array of colonial enemies on several continents.

From 1979-91, the US armed forces were modernized with new, high-tech equipment, along with organizational and operational concepts supporting a new "AirLand Battle" doctrine. This doctrine and equipment were validated in Grenada in 1983 and in Panama in 1989.

Unity of Command

In launching the Abyssinian expedition, the British government wisely decided that since the operation was to take place so far away, at the very end of what could only be a long and tenuous supply line, things would have to be done with great thoroughness, whatever the expense, if they were to be done at all. The actual formation of the expedition was vested with the nearest major British command, the Indian Army.

But just as with Schwarzkopf's CENTCOM 123 years later, once the Abyssinian operation was organized, Napier enjoyed unity of command. That is, he did not report to the colonial administration in India, but directly to the Horse Guards in London. (The "Horse Guards" was the British equivalent of the Pentagon during the mid-Victorian period.)

And just as Schwarzkopf resisted starting his operations prematurely, so, too, did Napier resist suggestions to reduce or limit the size of his expedition. Both generals continued to hope diplomacy would overturn the need for active operations, even as they feverishly continued to prepare for war.

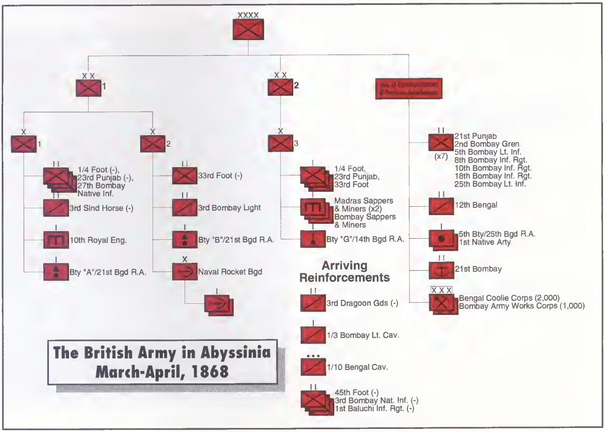
When questioned in Parliament about the cost of the Abyssinian expedition, Prime Minister Disraeli answered: "Money is not to be considered in such matters; success alone is to be thought of." That statement set the determined tone for Napier's campaign, just as Allied financial guarantees to the United States allowed military success to remain the prime criteria for the Gulf War. Neither campaign was hindered by misplaced economy.

Warfare Goes Modern — 1868 and 1991

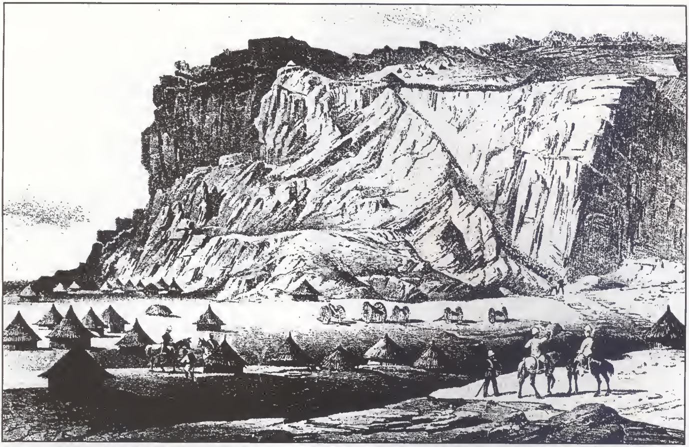
The detailed pre-planning Napier conducted for his expedition resulted in the British army's acquisition of 44 elephants to carry heavy guns, a "portable" railroad (complete with engines and 20 miles of track), telegraph lines, fresh water condensers, well-drilling equipment, hospital ships, and the construction of long piers, lighthouses, and warehouses at the port of Zula. Other modern equipment included new Snider-Enfield rifles, rocket launchers (340 six-pounder "Hale's War Rockets"), breach-loading 12-pounder cannon, special steel 7-pounder mountain guns, and battlefield photography cameras.

The artillery pieces for the mountain batteries were specially made for the expedition, and a basic load of 1,000 rounds of improved bursting shells was provided for each one.

The press was well-represented by numerous reporters, including the renowned correspondent and explorer Henry Morton Stanley (the "discoverer" of Dr. Livingstone in Africa.). Thirteen military observers from various nations also went along.


XXXX
XX 1
XX 2
line of communications & Garrison detachments
X 1
X 2
X 3
II 1/4 Foot (-), 23rd Punjab (-), 27th Bombay Native Inf.
II 3rd Sind Horse (-)
I 10th Royal Eng.
I Bty "A"/21st Bgd R.A.
II 33rd Foot (-)
II 3rd Bombay Light
I Bty "B"/21st Bgd R.A.
X Naval Rocket Bgd
I
1/4 Foot, 23rd Punjab, 33rd Foot
Madras Sappers & Miners (x2) Bombay Sappers & Miners
Bty "G"/14th Bgd R.A.
Arriving Reinforcements
II 3rd Dragoon Gds (-)
I 1/3 Bombay Lt. Cav.
••• 1/10 Bengal Cav.
II 45th Foot (-) 3rd Bombay Nat. Inf. (-) 1st Baluchi Inf. Rgt. (-)
II (x7) 21st Punjab 2nd Bombay Gren. 5th Bombay Lt. Inf. 8th Bombay Inf. Rgt. 10th Bombay Inf. Rgt. 18th Bombay Inf. Rgt. 25th Bombay Lt. Inf.
II 12th Bengal
I 5th Bty/25th Bgd R.A. 1st Native Arty
II 21st Bombay
XXX Bengal Coolie Corps (2,000) Bombay Army Works Corps (1,000)

The British Army in Abyssinia March-April, 1868



The natural fortress of Magdala, viewed from below. From a contemporary lithograph.

The only currency then broadly accepted in Abyssinia and the Red Sea region was the Austrian-minted "Maria Theresa" trade dollar (or "Taler") of 1780. These large silver coins had been used extensively for international trade throughout the Middle East for decades, and the British government let a special contract to the Imperial Mint in Vienna for a fresh supply of half a million of them. The dollars became especially useful to the lead columns of the expedition for purchasing food and fodder. They also worked to establish a feeling of confidence among the natives, since the British use of the coins indicated the invaders had a real understanding of the underpinnings of the local economy.

On to Magdala

Sir Robert's expeditionary force began moving inland from Zula in March. As they moved, they gained allies from among the tribes Theodore had earlier defeated on his way to becoming emperor. The climax of the swift invasion came when Theodore, along with his army and hostages, were cornered in the mountain fortress of Magdala on 10 April.

Magdala was a natural stronghold standing 9,000 feet above sea level near the Bashilo River. It was part of an extinct volcano, and its plateau of basalt (three-quarters of a mile long by half a mile wide) was perched 1,000 feet above the surrounding plain. This plateau was called "Islamgie" by the natives, and it dominated the nearby Arogie

Notes on the Abyssinian Army of 1868

**Estimated potential number of Ethiopian hostiles:
100,000 - 200,000**

Number of Ethiopian troops directly on Napier's line of march who became *de facto* British allies: Army of Ras Kassai of Tigre: 4,000; Army of Ras Menelik of Shoa: 7,500.

Army of "Mad" Emperor Theodore at the start of the war: 20,000.

At Arogie/Magdala: 10,000 (the best of the best).

Artillery:

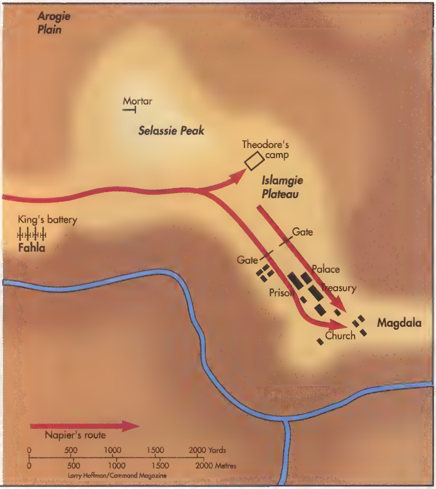
13 heavy howitzers

9 mortars, and 15 smooth-bore cannon, including three 56-pounders.

Infantry Armament:

All infantry carried spears, swords and shields; half also had muskets or flintlocks.

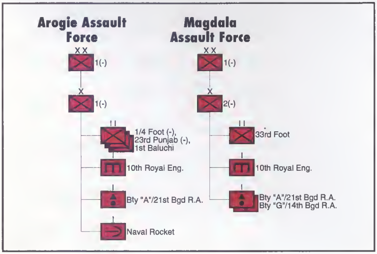
—*Andrew Preziosi*



Larry Hoffman/Command Magazine

Plain. The sides of Magdala were precipitous and there was only one practical path up the mountain. That path was blocked at the entrance to the citadel by a formidable gate.

Out of Napier's total of 37,000 men, only an elite force of about 5,000 made the final dash to Magdala. The rest were distributed back along the line of advance, attached to the two transport trains (called "Lowland" and "Highland") that kept the supplies flowing in pack-animal convoys up to the assault force.



Theodore had about 7,000 warriors, some artillery, including a huge 70-ton mortar (built for him by German weapons specialists) for use as a "terror" weapon. A strong stand by Theodore at Magdala could have inflicted heavy casualties on the British and might have lasted for weeks or months.

A critical engagement in the campaign occurred on the Arogie Plain on 10 April. The British columns emerged onto the plain stressed by heat, the severe ascent, and a growing lack of water. Theodore immediately engaged them with artillery from the heights above. However, his poorly trained gunners mostly overshot Sir Robert's deploying forces. The Abyssinian battle forces then charged down to engage the British, who had meanwhile deployed into skirmishing order.

Then the expedition's mountain batteries went into action, along with the Hale's War Rockets. Theodore's great mortar burst at its first discharge, and his other guns soon fell silent. British shells, rockets and repeating rifles quickly decimated the attackers, killing 700 and wounding 1,200. The surviving natives were then driven off the Arogie plain in desperate retreat. Many of Theodore's battle chiefs were among the dead.

After this defeat, Theodore reportedly became despondent and tried to commit suicide, but was also unsuccessful in that. Then he rallied, and just as Saddam would do later, released some of his hostages and tried to bargain. These talks dragged on for two days, but Napier refused to accept anything less than the release of all hostages and Theodore's own surrender.

The day after Easter, 13 April, the British began shelling Magdala with massed cannon fire, then advanced to capture the citadel by force of arms. About 3,400 rank and file were actually committed to the storming of Magdala. The *33rd "Duke of Wellington's" Regiment* led the attack and forced the gate, along with a rocky second barricade that had been thrown up. Only 15 officers and men were wounded during the final assault.

The Abyssinian army surrendered *en masse*, and Theodore finally did kill himself, ironically, by using a pistol originally sent to him as a gift from Queen Victoria in happier times.

War correspondent Stanley summarized the whole affair when he wrote: "Though a little war, it was a great campaign."

More Gulf Comparisons

The Gulf war also produced few casualties among the liberators. Only 88 Americans were killed in action, plus 59 others from among the Coalition forces. Friendly fire took its toll, but the large Iraqi army proved remarkably ineffective and vulnerable. Saddam, just as Theodore before him, got little for his huge investment in military hardware.

Saddam fought a static battle from prepared fortifications, but he lacked a flexible command and control system. All decisions were concentrated in his own hands and he was "blind" after the air campaign destroyed his ability to communicate effectively with his engaged forces.

The lesson to be learned here is much the same as was taught by the colonial wars of the 19th century. Former colonial enemies, which now make up much of the under-developed world, have armed forces that lack tactical and training expertise, truly functional command-control, and any working knowledge of the importance of logisitics.

Because Saddam centralized his power along strict authoritarian lines, he produced a large, uneducated and technically inept ruling class and military. Dictators generally fail to modernize their societies as they strain mightily to modernize their militaries.

Aftermath

Edmund Burke once said, "War never leaves where it has found a nation." And so it has been with Ethiopia and Iraq.

The British destroyed Magdala and withdrew in the same manner as the Coalition forces would later destroy Iraqi military equipment before withdrawing from the banks of the Euphrates River. Civil war and strife followed in Abyssinia that continues to this day. The future of Iraq looks similarly bleak.

Napier sailed for England and fame. He was rewarded with a promotion to field marshal, and became the hero of his day. Schwarzkopf also returned home to a hero's welcome.

Both campaigns were initially undertaken to protect the lives of hostages — European hostages in Abyssinia and a combination of Western hostages and a hostage nation, Kuwait, in the Gulf War — and to thwart the aggressive designs of tyrant dictators. Both Saddam and Theodore were to be punished, but their national territories were not coveted by the foreign interventionists. Neither campaign sought the extension of imperial boundaries as an objective, but the dignity of the British Empire and the international reputation of the United States were both at stake.

The aims of both campaigns, to certain degrees, were to restore the status quo in international relations. The resulting hostilities demonstrated the wonders of modern science for their times. The planning and execution of both wars showed a high degree of politico-military savvy and cooperation, both on the domestic and international scenes.

The events in Abyssinia in 1868 and in the Persian Gulf in 1991 are first of all comparable because they demonstrate the timeless principles of unity of command, detailed planning, concentrating on the objective, leadership, and military innovation. All those factors were applied skillfully in both campaigns. Yet both victorious campaigns resulted in inconclusive results once the combatants withdrew. Iraq may again become a threat to its own minority populations and the security of the Gulf region — possibly necessitating future interventions. In a broader sense, then, the two campaigns may yet also turn out be linked in that they both heralded the start of eras in which the primary military focus of the West centered on brushfire-type wars directed against dictators in the under-developed nations.

[Ed's Afterword: And does this also presage the start of a pseudo-imperial era wherein the major powers carve out new economic-colonial "empires" for themselves?] ✪

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Soviet Submarine Operations in World War II

by Carl O. Schuster

The Soviet navy entered World War II with the largest submarine force in the world, numbering over 168 boats. Over two-thirds of that force was stationed in European waters, and most of the vessels were less than ten years old. Moreover, they consisted of modern designs heavily influenced by German assistance dating back to the early 1920s, and the salvage of a British submarine sunk in 1919.

Nonetheless, Soviet submarines suffered from high noise levels and poor crew training. Their dictator's ambitious fleet construction program had called for 341 submarines to be built between 1934 and 1943. By the time of the German invasion, the USSR had 215 subs in service and another 100 undergoing sea trials or in various stages of construction.

That was an impressive industrial performance by any standard, but it was also one that had strained the fledgling Soviet shipbuilding industry to the limits. Construction was spread among eight shipyards and centered around five classes of submarines — ranging from small coastal units to large *Kreyser* (Cruiser) or K-class boats.

Manning the submarines also became a problem when over two-thirds of the senior officers were purged. Theoretically, every submarine commander was a graduate of a Soviet naval academy and had served four or five years in various positions on several submarines. But the purges and the rapid growth of the sub force made maintaining that standard impossible. Shortcuts were therefore taken.

Officers were drafted out of the merchant marine, given a quick course on submarines, and spent one tour as an executive officer. Those who "qualified" were then given command. This new process virtually guaranteed a limited experience level, and the Soviet command attempted to compensate for it by assigning a staff "rider" to go out with the new commanders (COs) on their first few cruises and periodically thereafter. They also established restrictive rules on diving and the conduct of attacks, probably in the hope of preventing a CO from attempting more than his crew could handle.

Combat gave the Soviets an intensive training crucible which eventually provided them a cadre of experienced COs by late 1944. Until that time, however, their submarine losses were far out of proportion to the results they achieved.

About a third (55 units) of the Soviet submarine fleet was stationed in the Baltic on 1 September 1939. Despite having the pick of the best submarines and crews, the Baltic Fleet Submarine Force failed to execute its very first wartime mission: the covert sinking of the Soviet tanker *Metallist* to provide a propaganda justification for Moscow's attack on Poland. The submarine SHCH*-303 missed, and the tanker had to be sunk instead by the a Soviet torpedo boat. It was an inauspicious beginning, and the Reds' submarines failed to improve at all by the start of the "Winter War" with Finland later that same year.

During that war, Soviet submarines, usually operating in pairs, gave their positions away by frequent communications and managed to sink only one Finnish merchant ship, two neutrals, and a few small coastal craft.

The Soviets recognized their faults, but the continued expansion of the fleet precluded their doing much about it. In addition to new construction, they had acquired four subs from the Baltic countries when they were occupied by the Red Army in 1940. Another problem was the overriding priority given to new construction. This meant repairs and routine maintenance on those boats already in service suffered.

The German invasion caught the Baltic Fleet with 69 operational submarines, 34 undergoing sea trials or fitting out, and another 22 under construction. Of all those boats, only 37 were actually combat ready, and 10 of them were on patrol.

Submarine losses to the Germans' attacks were immediate and heavy. At least 12 boats were sunk by 29 June, one week after the invasion began. Other units had to be scuttled when German ground forces approached their bases. By September, the Baltic Fleet was blockaded within its bases and incomplete units had to be evacuated to the Northern and Black Sea Fleets via the Russian river and canal system. The Germans used the time to lay multiple minefields in the Gulf of Finland to contain what was left of the Soviet submarine threat.

The two other western Soviet fleets initially fared better. Their bases were out of German bomber range and there was time to evacuate most non-operational units before Axis ground forces approached. The Black Sea and Northern Fleets had 47 and 15 operational submarines, respectively, on 22 June 1941. Neither fleet made contact with Axis forces until mid-July, and the resulting actions were inconclusive.

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*Non-Russian speakers note: Russian has a letter in its alphabet pronounced "Sh-ch." To say it correctly, say the two word English phrase "fresh cheese." Drop the "fre" from "fresh," and the "eese" from "cheese," and say again what's left over: "sh-ch."

Soviet losses in the Black Sea were confined to four units abandoned in the newly built Nikolayev shipyard east of Odessa. The Northern Fleet suffered no casualties at all, but it also failed to inflict any on the invaders, even after receiving six new units from the Baltic in August. The Black Sea Fleet also received several units from the Baltic by early fall. Despite the reinforcements, neither of those fleets gained any important successes in 1941.

The leadership in Moscow knew Germany's naval vulnerabilities. The Germans had extensive sea lines of communications passing through all three Soviet fleet areas. In the Arctic, the poor road network forced them to transport supplies by sea. The Germans also received 75 percent of their iron ore from Sweden, and all of that came by sea — through the Baltic eight months of the year, and by way of Narvik, Norway, during the cold winter months. Army Group South received a large portion of its supplies via coastal convoys emanating from the Danube River.

The arctic offered the most open ocean , and therefore seemingly provided the best opportunities for the Reds to prey on German shipping. But the harsh climate limited the Northern Fleet's operations. Units often operated under conditions of restricted visibility, and stormy weather many times precluded any sorties at all. Also, the Soviets had only primitive facilities to support their forces in the far north.

Moreover, the entire North Cape area is peppered with narrow and deep fjords which the Germans effectively sealed with mines. Thus, the Germans' coastal convoys moved from protected fjord to protected fjord, which both complicated the Soviet targeting problem and limited the areas from which they could attack.

Still, the Soviets attempted to maintain a continuous presence off the main German port of Petsamo, and throughout the North Cape area. They even provided a base at Polyarny for five Royal Navy submarines. Real offensive opportunities, though, remained scarce until 1944. Even then, the Soviets inflicted only light losses on the Germans, sinking only a few merchant ships and damaging nothing larger than a sub chaser.

The Baltic Fleet also had problems. Though Germany annually received almost eight million tons of iron ore via Baltic shipping lanes, the Soviets' only access to those routes, after August 1941, was through the narrow Gulf of Finland — and the Axis controlled both of its shores. By October, the Axis navies had the eastern Gulf sealed with nearly 2,000 mines. A second, and more extensive, anti-submarine net barrier was laid at the western mouth of the Gulf between March and May of 1942. Finnish and German submarines, aircraft, fast patrol boats and Anti-Submarine Warfare (ASW) units patrolled the area between.

Table No. 1
SOVIET SUBMARINE ORDER OF BATTLE BY FLEET

	1 Sep 1939	22 June 1941
Baltic Fleet		
A class	0	0
B class	5	1
D class	3	1
K class	1 (+10)	4 (+5)
L class	3 (+3)	3 (+3)
M class	16 (+7)	21 (+23)
P class	3	3
S class	6 (+6)	11 (+5)
SHCH class	17 (+11)	20 (+13)
Foreign Built	1	5*
Sub Tenders	4	4
Submarine Salvage Ships	1	1
Total Subs	55 (+37)	69 (+49)
Total Support Ships	5	5
Black Sea Fleet		
A class	5	5
D class	3	3
L class	1 (+3)	3 (+3)
M class	6 (+13)	14
S class	0 (+5)	4 (+2)
SHCH class	8 (+6)	15 (+3)
Sub Tenders	2	2
Total Subs	23 (+27)	44 (+8)
Total Support Ships	2	2
Northern Fleet		
D class	1	1
K class	2	2
M class	6	6 (+3)
SHCH class	5	6
Sub Tenders	1	1
Total Subs	14	15 (+3)
Total Support Ships	1	1
Pacific Fleet		
L class	6 (+7)	13
M class	37	37
S class	0 (+6)	2 (+4)
SHCH class	33 (+3)	35 (+3)
Sub Tenders	2	3
Total Subs	76 (+16)	87 (+7)
Total Support Ships	2	3
Total Soviet Submarines	**168**	**215**

Notes: Numbers in parentheses indicate the number of submarines under construction, fitting out, or in sea trials within a fleet area. Construction totals in the table don't match those in the text because many M class units were built in the Gorky and Sverdlovsk shipyards and thus were not located in any fleet area. Shipyards in the Northern Fleet area were newly completed in late 1940, and could only be used for final assembly.

*Foreign submarines included one British and four Baltic country boats. The British sub L-55 was sunk by a Soviet destroyer in 1919, then recovered by the Reds in 1928, refurbished and recommissioned in 1931. The Soviets also seized two submarines, each, from Estonia and Latvia when they occupied those countries in August 1940.

Table No. 2
SOVIET SUBMARINE DATA BY CLASS

Class (Soviet Built)

A A.1-5; comm 1921-28; 356/453 ts; 12/8 kts; arm 4-4.5 cm TT, 4 torps, 1-45 mm gun, 1-MG; range 1,500/80 nm at 7/3 kts; compl 22. Fate: Refurbished and recommissioned after the Russian Civil War. Stationed in Baltic Fleet; 3 were lost in WWII. Survivors discarded in 1945.

B B.2, B.4-6, B.6, B.8; comm 1915-16; 664/753 ts; 11.4/9 kts; arm 4-53.3 cm TT, 6 torps, 2-76 mm guns, 1-45 mm gun; range 3,700/60 nm at 7/3 kts (submerged); compl 25. Fate: Discarded in 1940.

D D.1-5; comm 1930-31; 920/1, 318 ts; 15/8.4 kts; arm 8-53.3 cm (6 fwd/2 aft), 10 torps, 1-102 mm gun, 1 or 2-45 mm guns, 2 mine tubes, 8 mines; range 7,000/105 nm at 9/4 kts; compl 60. Fate: Served in all 3 western fleets. D.1 sunk in training accident in 1940. D.2 damaged by German bombs 11/8/41, but was the only unit to survive the war.

K K.1-3, 21-24, 51-56; comm 1940-42; 1,480/2,095 ts, 22.5/10 kts; arm 8-53.3 cm (4 fwd/4 aft), 22 torps, 2-100 mm, 2-45 mm guns, 2 mine tubes, 20 mines; range 15,000/160 nm at 9/3 kts; compl 65. Fate: Served with Baltic and Northern Fleets. Five units lost in action.

L L.1-24; comm 1933-42; 1,040/1,335 ts (L.1), 1,200-1,550 ts (all others); 14/9 kts; arm 6-53.3 cm TT (4 fwd/2 aft), 12 torps, 1-100 mm, 1-45 mm gun, 2 mine tubes, 14 mines; range 7,400/154 nm at 8/3 kts; compl 54. Fate: L.7-19 built and served in Pacific Fleet. L.15 transferred to Northern Fleet via Panama Canal in 1942. Other 12 units' construction divided equally between Baltic and Black Sea Fleets. Six units sunk in the war.

M M.1-13, 15, 16, 18-28, 33-36, 46, 51-63, 71-83, 89, 90, 94-99, 101-108, 112-122; comm 1933-47; 161/202 (1st 2 series), 206/258 ts; 14/8 kts; arm 4-53.3 cm (2 fwd/2 aft), 4 torps, 1-45 mm gun; range 1,600/55 nm at 8/2 kts (1st 2 series), 3,440/107 nm at 9/3 kts; compl 18. Fates: Assigned evenly between the Baltic and Black Sea Fleets; 35 were lost in the war. Survivors served into the mid-1950s.

P P.1-3, comm 1936-37; 955/1,671 ts; 18.8/7.7 kts; arm 6-53.3 cm (4 fwd/2 aft), 10 torps, 2-100 mm, 1-45 mm gun; range 5,750/105 nm at 10.7/4 kts; compl 54. Fates: All assigned to Baltic Fleet and used primarily as supply boats. All lost in the war, but P.2-3 were recovered post-war and served into the mid-1950s.

S S.1-16, 19, 31-38, 51-58, 101-104, comm 1936-45; 840/1,070 ts; 19.5/9 kts, arm 6-53.3 cm TT (4 fwd/2 aft), 12 torps, 1-100 mm and 1-45 mm guns; range 9,800/148 nm at 10/3 kts; compl 50. Fates: Served with all fleets. Fifteen were lost in the war. Survivors served into the late 1950s.

SHCH SHCH.101-141, 201-216, 301-311, 317-320, 322-324, 401-411, comm 1935-44; 577/702 ts; 11-14/8 kts; arm 6-53.3 cm TT (4 fwd/2 aft), 10 torps, 1 or 2-45 mm guns; range 3,250/110 nm at 8/2 kts (1st series units), 6,700/100 nm at 8/2 kts; compl 35 (1st series), 38. Fates: Assigned evenly among all fleets; 32 lost in the war. Survivors served until the mid-1950s.

Foreign Built

L.55 comm 1931, 954/1,139 ts; 13.5/8 kts; arm 6-53.3 cm TT (4 fwd/2 aft), 12 torps, 2-7.6 mm guns; range 6,000/100 at 7/3 kts; compl 36 (?). Fate: British submarine sunk by Soviets in 1919, recovered in 1928, repaired and recommissioned. Served with Baltic Fleet until decommissioned in late 1940.

Kalev & Lembit comm 1941, 600/820 ts; 13.5/8.5 kts; arm 4-53.3 cm TT fwd, 1-40 mm gun, 20 mines; range 2,000/40 nm at 10/3 kts; compl 35 (?). Fate: Built in Britain in 1935-36, taken over by Soviets in 1940. *Kalev* was scuttled in Tallin in 8/41. *Lembit* survived the war and was scrapped in the late 1940s.

Ronis & Spidola comm 1941, 390/514 ts; 14/9.25 kts; arm 6-45.7 cm TT (2 fwd/4 external in 2x2 trainable tubes), 1-76 mm gun, 3-MGs; range 1,600/85 nm at 14/9 kts; compl 24 (?). Fate: Built in France and delivered to Latvian navy in 1926. Taken over by Soviets in 1940 and scuttled in 1941 to prevent capture by Germans. Units were never employed.

V.1 comm 1944, 768/990 ts, 13.75 kts; arm 6-53.3 cm TT fwd, 12 torps, 1-3″ (76 mm) gun; range 6,000/48 nm at 10/3 kts; compl 39. Fate: Ex-Royal Navy sumbarine, *Sunfish,* originally commissioned in 1935. Transferred to Soviet navy in 8/44 as compensation for surrendered Italian tonnage turned over to Anglo-Americans. Served with Northern Fleet and returned to RN in 1947.

V.2-4 comm 1944, 630/730 ts, 11.5/9 kts; arm 4-53.3 cm TT fwd, 8 torps, 1-3″ (76 mm) gun, 3-.303 MGs; range 4,050/72 nm at 10/3 kts; compl 33. Fate: Ex-Royal navy U-class submarines ((ex-*Unbroken* (V.2), ex-*Unison* (V.3), ex-*Ursula* (V.4))) transferred to Soviet navy in 8/44 as compensation for surrendered Italian tonnage turned over to Anglo-Americans. Units were returned to RN in 1948.

Notes: comm=commissioning dates, #/#=displacement surfaced/submerged, #/#=maximum speed surfaced/submerged in knots (kts); arm=armament. TT=Torpedo Tubes, torps=torpedoes, MG=Machine Guns, range #/#=range at surface speed (on diesels)/submerged (on batteries); compl=complement, or number of officers and men nominally assigned.

Soviet Baltic Fleet submarines therefore had to sail a 200 nautical mile gauntlet before even reaching Germany's sea lanes. Most of their losses occurred in that area, and the Baltic submarine campaign was marked by extensive small unit actions around the minefields as the Soviets tried to break through in groups. The barriers remained a severe impediment to submarine operations until Finland left the war in September 1944, and the entire network was dismantled. As a result, the Baltic Fleet enjoyed most of its submarine successes in the final half-year of the war.

The Black Sea Fleet faced a different set of problems. It had few targets in the first six months of the war. Once Sevastopol fell, the Axis sea lines extended out to the eastern end of the Crimea. At the same time, however, that city's fall also forced the Black Sea Fleet to stage its ships out of the small cities of Poti and Tuapse in the eastern Black Sea. Logistical facilities were limited there, but at least there were no choke points between the bases and their target areas.

Still, the Baltic Fleet submarines had a difficult time attacking Axis shipping. Most of it consisted of small freighters and barges which operated in the shallow waters close to shore. The 50-fathom curve extended out some 35 nautical miles from the western Black Sea coast, and the Axis navies laid nearly 8,000 mines in that shallow zone. They also concentrated their convoys into large formations protected by heavy escort groups. The relatively short transit distances between ports further limited the convoys' exposure to sub attack and enabled the Germans to restrict movement to the daylight hours when they could employ aircraft support. Finally, the Germans relied on shallow draft vessels which were generally not suitable targets for torpedo attack, while the size of the escorts and *Luftwaffe* air supremacy precluded surface attacks, except at night.

The German air force was a powerful deterrent to submarine attacks, and remained so until the Soviets finally gained air superiority in June 1944. But just as in the Baltic, the Soviets actually lost more submarines to mines than any other single cause.

In sum, the Soviet submarine force conducted its campaigns in environments of severe logistical, personnel and operational constraints. It faced those difficulties with great determination and often proved innovative in finding solutions to its problems. Despite having all but two of their shipyards overrun by German forces, the Soviets went on to produce 57 new submarines during the war, as well as repairing damage to more than 30 others.

Submarine production was centered around five basic types: the K, L, SHCH, S, and M classes (see Table 2). Refinements were added to new units and improvements made on boats entering the yards for repairs. Interestingly, the M class was built in Gorky, southeast of Moscow, then transported in sections along the inland river-canal system, to either Leningrad or Severodvinsk (near Archangel) for final assembly. Units destined for the Black Sea were dispatched, again on the river-canal system, to the Sea of Azov.

Table No. 3
SOVIET SUBMARINE SUCCESSES

Year	Baltic	North.	Black Sea	Pacific
1939	0-0	NA	NA	0*
1940	1-703	0	0	NA
1941	2-4,067	5-7,199	5-15,845	NA
1942	19-40,146	10-19,020	9-11,526	NA
1943	—**	14-26,169	15-30,168	NA
1944	12-20,969	7-15,819	5-6,858	NA
1945	15-67,504	NA	NA	4-unkwn
Totals	**48-132,686**	**36-68,207**	**34-64,847**	**4-unkwn**

Tatal Axis Losses: 122 ships of 265,740 Gross Registered Tans (GRT).

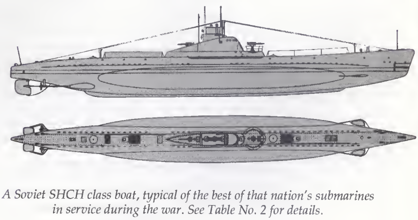
Notes: #-#=Number of ships and GRT (A measure of a ship's internal volume).

*Although Japan and the Soviet Union fought along the Chinese-Mangalian barder in September 1939, there were no naval actians.

** Operations were suspended as a result of heavy losses due to the effectiveness of the Finno-German ASW minefield/barriers in the Gulf of Finland.

Two experimental submarines were launched during the war, but only one was actually completed, the M-401. It used a closed-cycle diesel for propulsion, and was tested successfully in the Caspian Sea, but never saw operational service. A submerged stabilization system, to enable a sub to "hover" at a given depth, was also tested during the war and used operationally in 1944. Other improvements noted on Soviet submarines during the war included quieter engines, better hydrophones and sonar.

Despite testing a primitive snorkel device before the war, the Soviets did not pursue develop-



A Soviet SHCH class boat, typical of the best of that nation's submarines in service during the war. See Table No. 2 for details.

Table No. 4
SOVIET SUBMARINE LOSSES
Losses by Fleet

Year	Baltic	Northern	Black	Pacific
1939	0	1	0	0
1940	1	1	0	0
1941	29	0	12	0
1942	16	10	11	1
1943	5	10	4	0
1944	1	6	4	0
1945	1	0	0	1
Totals	**53**	**28**	**31**	**2**

Baseline Number plus Construction

Units ocquired form foreign sources (pre'41)	4
New construction, 9/1/39-6/22/41	39
New constructionofter 6/22/41	57
Foreign Acquisitions (1944)	4
Totol odditions, 9/1/39-8/9/45	100
Units in commission 9/1/39	168
Total subs commissioned during war	272

Deletions

Decommissionings, 9/1/39-6/22/41	4
Totol wor losses	114
Units in commission 8/9/45	154
Percentoge of force lost in combat or occidents	41%

Note: Of the notions participoting in World Wor II, only Germony suffered o higher loss rate in its submarine force.

ment of it, and waited instead until after 1945 to install a copy of the German "Schnorkel" on their own units.

The Soviets also used their submarines to land agents and raiding parties, conduct intelligence collection, and for minelaying. Though the Soviet submarine force achieved only limited results during the war (see Table 3), their crews pressed home their attacks in the face of heavy losses and often overwhelming odds. They got better as the war progressed and tried increasingly complex tactics involving cooperation with surface units, fast patrol boats, and even aircraft. They also increasingly conducted their attacks "acoustically," relying on sonar and hydrophones, instead of the periscope, to target their torpedoes. Though those new tactics were generally ineffective, they cut losses and did cause the Germans much concern in the final days of the war.

Despite its problems, losses and lack of recognized success, the Soviet submarine force drew German naval resources away from other theaters and tasks, provided intelligence support to Red Army commanders, and facilitated that army's campaign against the German rear in the far north and along the Baltic coast. In those respects, the Soviet submarine campaign was successful.

As a final note, the Soviets' Pacific Fleet submarines saw no action during the war. The Pacific Fleet had only been re-established in 1935, but it had the largest submarine contingent by 1939. Five of its units transferred to the Northern Fleet in 1942-43 and returned after the war.

By the time Moscow declared war on Japan in August 1945, there was virtually no Japanese shipping left to attack. Nonetheless, at least two Soviet submarines were lost in the Pacific. One, the L-16, was mistakenly sunk by the Japanese submarine I-25, as it cruised off the U.S. west coast *en route* to the Northern Fleet via the Panama Canal. The other was lost in either Japanese or American minefields near Hokkaido. ✪

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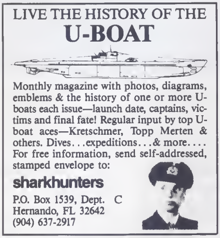

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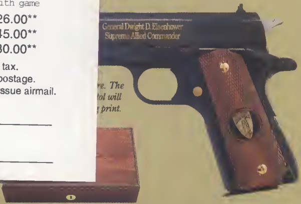

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6. Place a "1" as your answer to this question if you prefer feature articles that deal with single battles. Place a "2" as your answer to this question if you prefer articles that deal with whole campaigns. Place a "3" as your answer to this question if you've no preference either way or if it varies from article to article and topic to topic.

This Issue

Rate the contents of this issue using a 0-9 scale. A "0" means you weren't even motivated enough to read that particular piece. "1" means you read it, but hated it. From there, "2," "3," "4," etc., each indicate slightly more favorable opinions, until you reach "9," which means, "I can't imagine a better article on the subject; I loved it."

7. Short Rounds
8. Port Arthur
9. Air/Land Operations
10. The Old Flag

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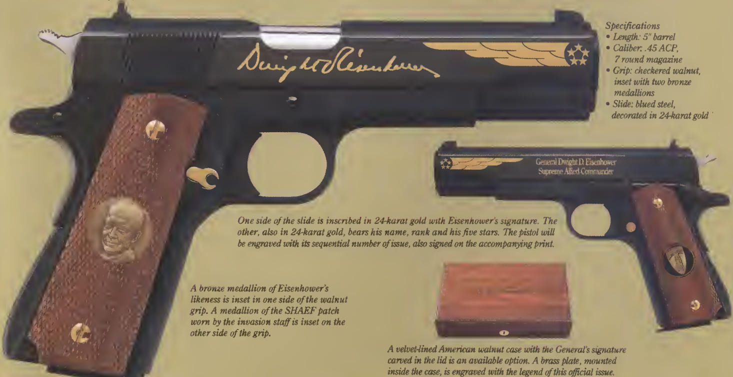

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Game Designers:
Mark Herman
Richard Berg
Art Director:
Rodger B. MacGowan

The Great Battles of

Alexander

The Macedonian Art of War

Gaugamela • Issus • Granicus • Chaeronea

The Great Battles of Alexander is an exciting battle game that challenges you to match the generalship of Alexander the Great in four of his most important victories – from his initial triumph over the hoplites of Greece to his final conquest of the massive armies of the Persian Empire, 338 B.C. – 331 B.C..

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Alexander Battle Module

Juggernaut:

The Battle of Hydaspes, 326 B.C

Alexander moves east, into India, to fight his final, major battle. **Juggernaut** includes a *$10 Off Coupon* towards the purchase of **Great Battles of Alexander** or **SPQR**.

Game Features

	SPQR	Alexander
Number of Battles	Five	Four
Counters	800	600
Maps (22x34 inch)	Four	Four
Playing Time	2-8 hrs.	1-4 hrs.
Solitaire Playability	Yes	Yes
Scenarios	Multiple	Multiple
Special Rules	Yes	Yes

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	Juggernaut Module	$10.00	
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	Hornet Leader	$30.00	
	1863: Four Civil War Battles	$37.00	
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